

Disclaimer: Information contained in the report addresses environmental conditions only and is not the official South Florida Water Management District operations recommendation or decision.

## **M E M O R A N D U M**

**TO:** John Mitnik, Assistant Executive Director, Executive Office Staff

**FROM:** SFWMD Staff Environmental Advisory Team

**DATE:** November 25, 2020

**SUBJECT:** Weekly Environmental Conditions for Systems Operations

### **Summary**

#### **Weather Conditions and Forecast**

A weak cold front extending from the central Bahamas through northern Cuba this morning should remain stationary and gradually become diffuse in a day or two. Shallow moisture behind the front is expected to produce light showers that could begin moving onshore portions of Miami-Dade and Broward Counties later today through the overnight. Rainfall from these showers is expected to be minimal. Elsewhere across the District, dry weather is expected to persist for a few days, except for what could be a marginal increase of light shower activity over the eastern part of the District on Thursday and/or Friday. By the weekend, light to moderate shower activity is possible over the eastern part of the District on Saturday and then area wide on Sunday. Total rainfall is still projected to be below the daily climatological average. A vigorous storm system moving out of the southern Plains on Saturday is forecast to cross the Mississippi River Valley on Sunday and strengthen further while moving through the southeastern United States on Monday next week, when a second weather feature in the northern jet stream catches up to it. The combined system should push a cold front through the northwestern part of the District Monday afternoon and evening, ahead of which a broad region of moderately heavy or heavy rainfall is predicted. The fast-moving nature of the rains would probably limit local maxima to two or two and a half inches, and an overall widespread coverage that could top a half of an inch or more over parts of the western or northwestern half of the District. While the rains are likely to diminish some in coverage and intensity by the time the cold front reaches the eastern or southeastern half of the District during the evening and overnight (after optimal peak daytime heating), the storm system could still generate a few streaks of heavier rains. The front should then move offshore the southeast coast sometime Tuesday morning, followed by a pronounced drying and significantly cooler temperatures. Dry conditions with no measurable total rainfall are likely from later Tuesday morning through at least Wednesday.

#### **Kissimmee**

Tuesday morning stages were 58.0 feet NGVD (at schedule) in East Lake Toho, 55.0 feet NGVD (at schedule) in Toho, and 52.9 feet NGVD (0.4 feet above schedule) in Kissimmee-Cypress-Hatchineha; headwater stages were 46.2 feet NGVD at S-65A and 27.1 feet NGVD at S-65D. Tuesday morning discharges were 770 cfs at S-65, 1,080 cfs at S-65A, 1,580 cfs at S-65D and 1,810 cfs at S-65E. Dissolved oxygen concentration in the Kissimmee River averaged 4.7 mg/L for the week through Sunday. Kissimmee River mean floodplain depth on Sunday was 0.99 feet. Today's recommendation is to maintain at least minimum flow of 300 cfs +/- 50 cfs at S-65A.

#### **Lake Okeechobee**

Lake Okeechobee stage was 16.24 feet NGVD on November 23, 2020, 0.17 feet lower than the previous week and 0.11 feet lower than the previous month. Rainfall was much reduced over the past two weeks and inflows declined from a high of over 8,500 cfs on November 11 to less than 4,000 cfs on November 23. Stage has been above or near the top of the envelope since August 1, 2020 and is

currently 0.74 feet above. Satellite imagery suggests cyanobacterial bloom potential is low on the lake, likely due to high winds, heavy rain and residual effects associated with Tropical Storm Eta.

### **Estuaries**

Total inflow to the St. Lucie Estuary averaged more than 3,483 cfs with approximately 1,573 cfs coming from Lake Okeechobee. The seven-day average salinities remained low in the north fork (HR1) and increased at the US1 Bridge and downstream over the past week. Salinity at the US1 Bridge is in the poor range (0-5) for adult eastern oysters.

Total inflow to the Caloosahatchee Estuary averaged 7,036 cfs over the past week with approximately 3,966 cfs coming from the Lake. Seven-day average salinities remained almost fresh (0.2) at the three most upstream sites (S-79, Val I75 and Ft. Myers Yacht Basin), increased slightly at Cape Coral, and decreased at Shell Point and Sanibel over the past week. Salinities are in the good range (0-10) for tape grass at Val I-75 and Ft. Myers. Salinities are in the good range (10-30) for adult eastern oysters at Shell Point and Sanibel, and in the poor range (0-5) at Cape Coral.

Lake stage is in the Intermediate Sub-Band of 2008 LORS. Tributary hydrological conditions are very wet. The LORS2008 Release Guidance suggests up to 4000 cfs release at S-79 to the Caloosahatchee Estuary and up to 1800 cfs release at S-80 to the St. Lucie Estuary.

### **Stormwater Treatment Areas**

Over the past week, approximately 100 ac-ft of Lake Okeechobee water was delivered to the FEBs/STAs. The total amount of Lake releases sent to the FEBs/STAs in WY2021 (since May 1, 2020) is approximately 94,600 ac-feet. The total amount of inflows to the STAs in WY2021 is approximately 1,419,000 ac-feet. Most STA cells are above target stage. STA-1E Western Flow-way is offline for the Restoration Strategies project to fill and grade Cells 5 and 7. Operational restrictions are in place in STA-1W Northern Flow-way related to STA-1W Expansion #1 startup activities, in STA-2 Flow-way 2 for construction activities, in STA-1E Central Flow-way, STA-2 Flow-way 3, STA-2 Flow-way 4, STA-3/4 Eastern, Central, and Western Flow-ways for vegetation management activities, and in STA-5/6 Flow-ways 2 and 3 following the Restoration Strategies project to grade non-effective treatment areas. This week, there is no capacity for Lake releases in the STAs.

### **Everglades**

WCA-1 is close to schedule and WCA-2A and 3A are well above schedule. At the gauges monitored for this report WCA-1 is around 0.54 feet, central WCA-2A is 2.3 foot, WCA-3A North is 2.2 feet and WCA-3A South around 1.9 feet above the mean stage at those locations for this time of year. Tens of thousands of Ibis were observed foraging in Big Cypress, thousands of Ibis in the Marl Prairies and thousands of mixed species wading birds foraging along the coastal margins. In Florida Bay and Taylor Slough there was much less rainfall last week and stages decreased. Levels in the northern slough are similar to post-Irma conditions. Salinities increased slightly on average across Florida Bay, but remain below average. Salinities in the TR mangrove zone to the east remained near fresh as discharge rates from the creeks remain high with the highest weekly totals seen this water year occurring last week.

## Supporting Information

### KISSIMMEE BASIN

#### Rainfall

The Upper Kissimmee Basin received 0.39 inches of rainfall in the past week and the Lower Basin received 0.04 inches (SFWMD Daily Rainfall Report 11/21/20).

#### Upper Kissimmee

**Table 1** lists stage and discharge for several KCL water bodies using data from lake outfall structures. KCL stage hydrographs with respective regulation schedules and rainfall are shown in **Figures 1-3**.

**Table 1.** Average discharge (cfs) for the preceding seven days, stage (feet NGVD), and departures from KCL flood regulation (R) or temporary schedules (T, A, or S); provisional, real-time data are from SFWMD.

Report Date: 11/24/2020

Water Body	Structure	7-day Average Discharge (cfs) <sup>1</sup>	Stage Monitoring Site <sup>2</sup>	Lake Stage (feet)	Schedule Type <sup>3</sup>	Schedule Stage (feet)	Daily Departure (feet)						
							11/22/20	11/15/20	11/8/20	11/1/20	10/25/20	10/18/20	10/11/20
Lakes Hart and Mary Jane	S-62	133	LKMJ	61.1	R	61.0	0.1	0.1	-0.1	0.0	0.0	0.1	0.1
Lakes Myrtle, Preston, and Joel	S-57	50	S-57	62.1	R	62.0	0.1	0.0	-0.1	0.0	0.0	0.2	0.2
Alligator Chain	S-60	83	ALLI	64.1	R	64.0	0.1	0.1	-0.1	-0.3	-0.1	-0.1	-0.1
Lake Gentry	S-63	117	LKGT	61.6	R	61.5	0.1	0.0	0.0	-0.1	-0.1	0.0	0.0
East Lake Toho	S-59	440	TOHOE	58.0	R	58.0	0.0	0.1	0.0	-0.1	0.0	-0.2	0.0
Lake Toho	S-61	884	TOHOW, S-61	55.0	R	55.0	0.0	0.0	-0.1	-0.2	-0.1	-0.1	0.1
Lakes Kissimmee, Cypress, and Hatchineha	S-65	784	KUB011, LKIS5B	52.9	R	52.5	0.4	0.4	0.0	-0.1	0.1	0.2	0.5

<sup>1</sup> Seven-day average of weighted daily means through midnight.

<sup>2</sup> Names of in-lake monitoring sites and structures used to determine lake stage; if more than one site is listed, an average is reported.

<sup>3</sup> A = projected ascension line, R = USACE regulation schedule, S = temporary recession target line, T = temporary schedule, N/A= not applicable or data not available.

DATA ARE PROVISIONAL

## Lower Kissimmee

Discharges at lower basin structures are shown in **Table 2**. **Figure 4** compares floodplain inundation depths from one year and one month ago with current inundation depths in the Phase I restored area of the Kissimmee River. **Figure 5** shows dissolved oxygen concentration along with S-65A discharge, water temperature and rainfall. **Figures 6-8** are included for reference: **Figure 6** is the current guide for operation of S-65 and S-65A, called the “Preferred Discharge Plan IS-14-50.0”. This is developed collaboratively each year between ecologists and SFWMD water managers based on prevailing ecological and hydrologic conditions. A preferred discharge plan and the interim regulation schedule (**Figure 7**) will be used until the Headwaters Lakes Revitalization regulation schedule is implemented. **Figure 8** is a map of the Kissimmee Basin showing Central and Southern Florida (C&SF) flood control project structures and color-coded watersheds.

**Table 2.** One- and seven-day average discharge at lower basin structures, dissolved oxygen concentration in phases I and II/III area river channel, and depth in the Phase I area floodplain using provisional, real-time data from SFWMD.

**Report Date: 11/24/2020**

Metric	Location	1-Day Average	Average for the Preceding 7-Days <sup>1</sup>								
		11/22/2020	11/22/20	11/15/20	11/8/20	11/1/20	10/25/20	10/18/20	10/11/20	10/4/20	9/27/20
Discharge (cfs)	S-65	816	784	385	187	209	180	678	1,265	1,725	2,890
Discharge (cfs)	S-65A <sup>2</sup>	1,108	1,095	724	361	330	346	861	1,916	2,248	3,578
Discharge (cfs)	S-65D <sup>2</sup>	1,679	1,685	1,590	797	1,122	1,714	3,267	4,848	4,715	5,198
Headwater Stage (feet NGVD)	S-65D <sup>2</sup>	26.91	26.98	27.03	26.94	27.35	27.62	27.66	27.68	27.75	27.73
Discharge (cfs)	S-65E <sup>2</sup>	1,853	1,835	1,904	895	1,283	1,935	3,501	5,287	5,081	4,994
Discharge (cfs)	S-67	0	0	0	0	0	0	0	0	0	0
DO (mg/L) <sup>3</sup>	Phases I & II/III river channel	5.0	4.7	5.2	5.6	3.8	3.0	1.5	1.2	1.2	1.2
Mean depth (feet) <sup>4</sup>	Phase I floodplain	0.99	0.94	0.75	0.52	0.94	0.75	0.53	0.66	1.52	2.70

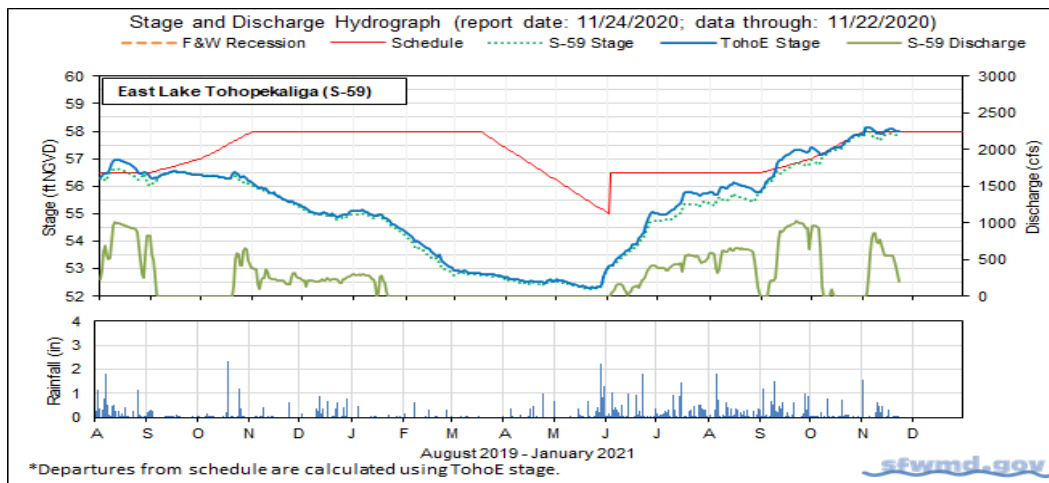
<sup>1</sup>Seven-day average of weighted daily means through Sunday midnight.

<sup>2</sup>S-65A discharge combines S-65A with auxiliary structures; S-65D discharge combines discharge at S-65D, S-65DX1, and S-65DX2; S-65D stage averages stage at S-65D and S-65DX1; S-65E discharge combines S-65E and S-65EX1.

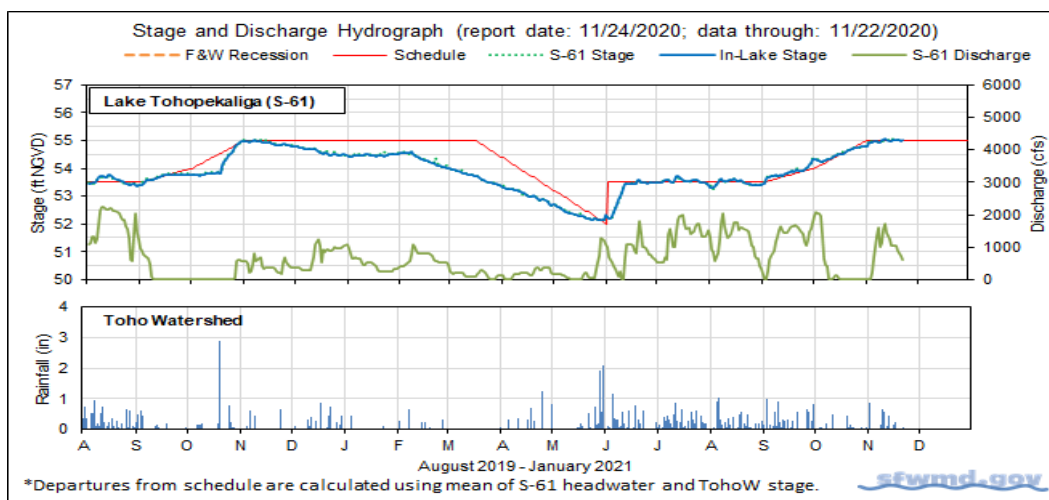
<sup>3</sup>DO is the average for sondes at KRBN, PC62, PC33, PD62R, and PD42R.

<sup>4</sup>1-day spatial average from South Florida Water Depth Assessment Tool (SFWDAT).

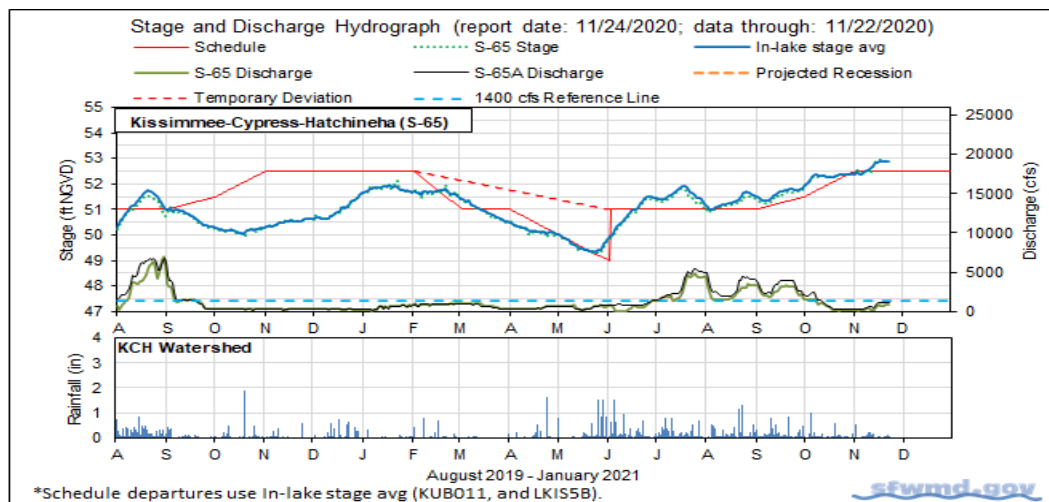
DATA ARE PROVISIONAL; N/A indicates that data were not available.



**Figure 1.** East Lake Toho regulation schedule, stage, discharge and rainfall.

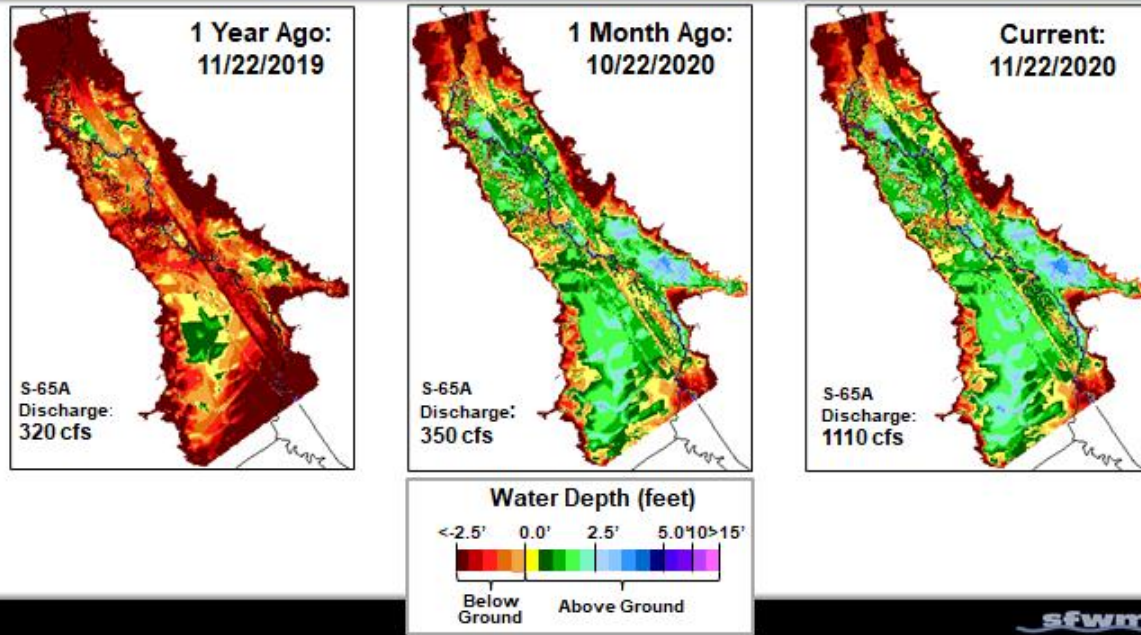


**Figure 2.** Lake Toho regulation schedule, stage, discharge and rainfall.

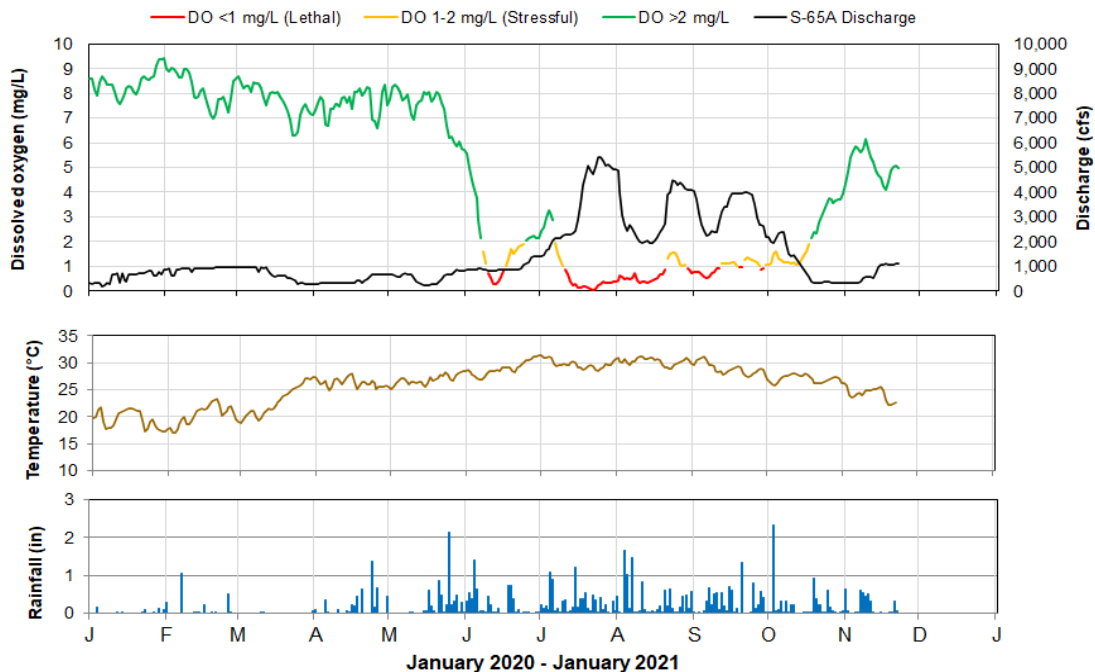


**Figure 3.** Lakes Kissimmee, Cypress and Hatchineha regulation schedule, stage, discharge and rainfall.

# Kissimmee River Phase I Restoration Area Water Depth Maps



**Figure 4.** Phase I area floodplain water depths (from left to right) one year ago, one month ago and current. Color-coding has been modified to accommodate greater water depths; these maps are not directly comparable to Kissimmee Basin WDAT maps published prior to January 16, 2012.

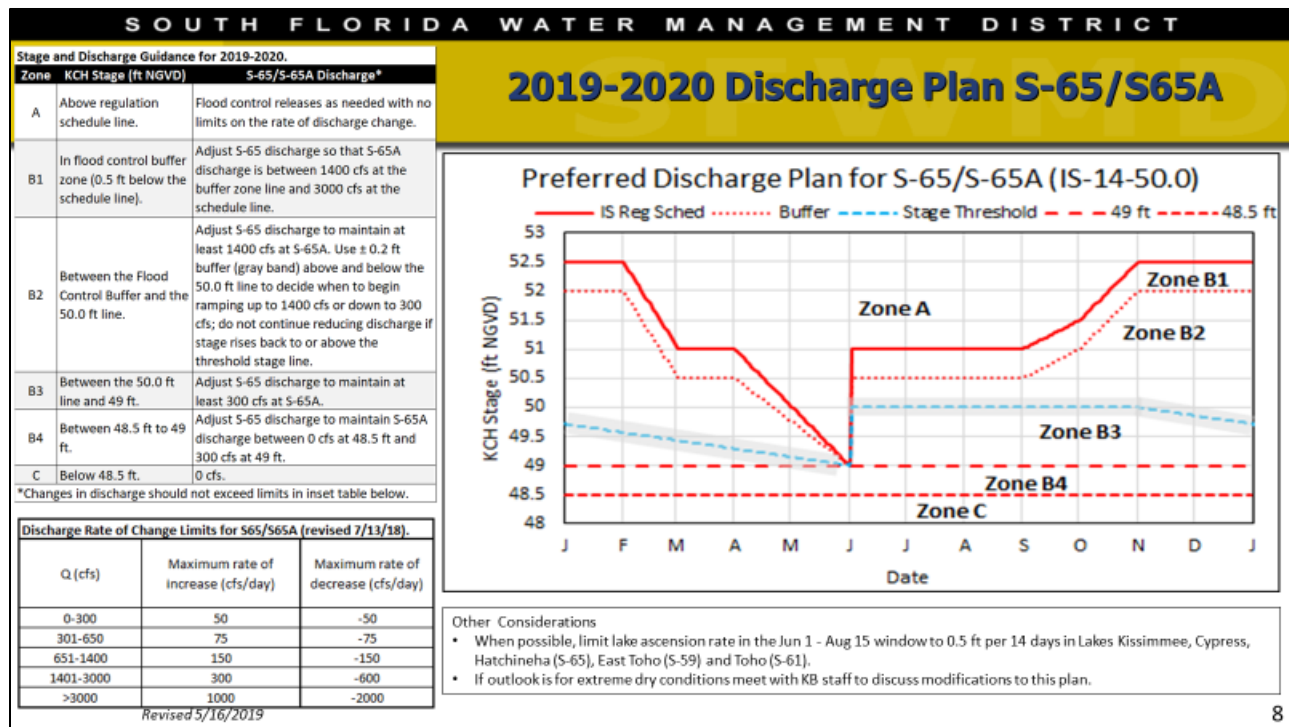


Dissolved oxygen (DO) and temperature are mean daily values averaged for PC62, KRBN, PC33, PD62R and PD42R with an average of 3 stations reporting this week. Rainfall values are daily totals for Kissimmee River (Pool BCD) AHED watershed.

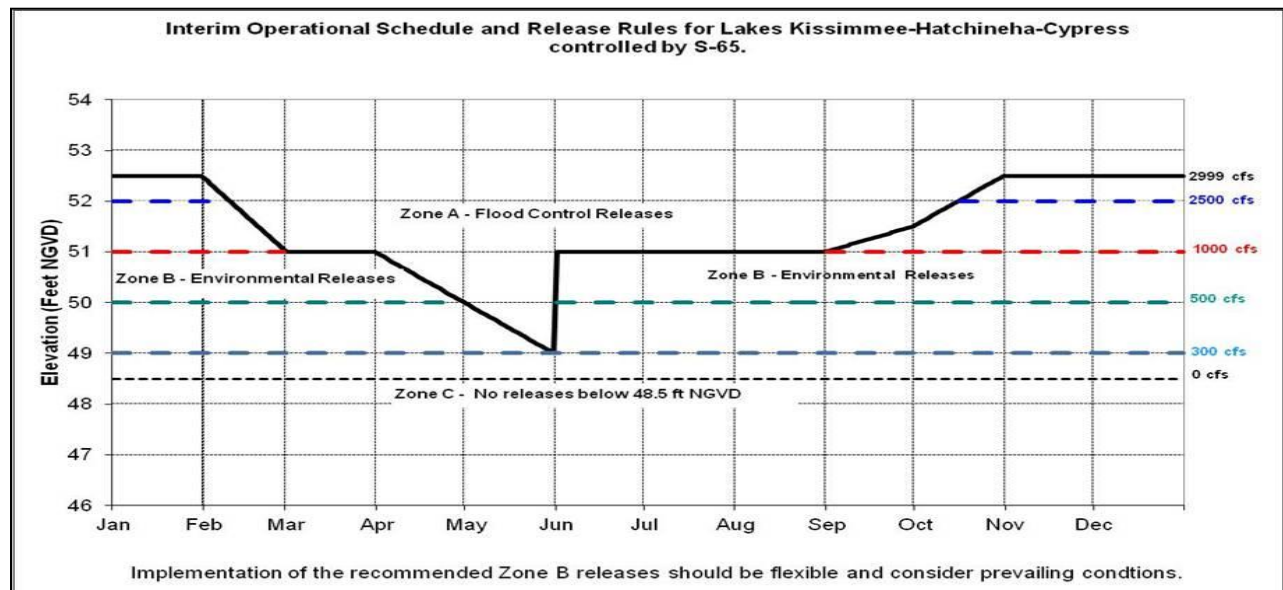
Report Date: 11/24/2020; data are through: 11/22/2020

sfwmd.gov

**Figure 5.** Restored Kissimmee river channel mean daily dissolved oxygen concentration (mg/L), S-65A discharge (cfs), temperature (°C) and rainfall (inches)



**Figure 6.** The 2019-2020 Discharge Plan for S-65/S-65A.



**Figure 7.** Interim operations schedule for S-65 (solid black line). The discharge schedule shown to the right has not been used in recent years.

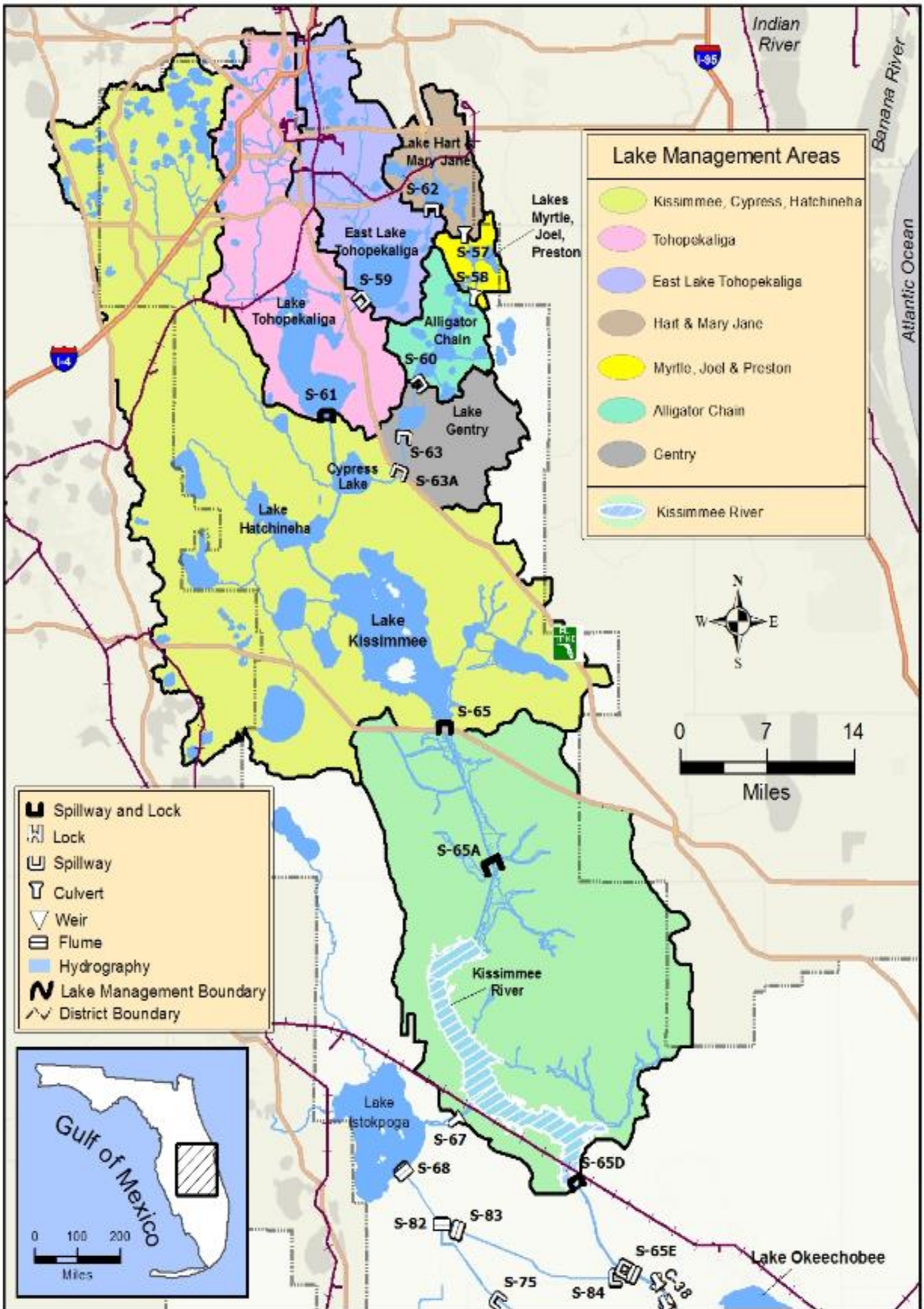


Figure 8. The Kissimmee Basin.

## **LAKE OKEECHOBEE**

Lake Okeechobee stage is 16.24 feet NGVD, 0.11 feet lower than a month ago, and 3.10 feet higher than one year ago (Figure 1). Lake stages rose into the lower portion of the preferred ecological envelope on June 2, 2020 (Figure 2) but have been above the envelope since the end of July; currently 0.74 feet above. Lake stage moved from the Beneficial Use sub-band in mid-July to the Intermediate sub-band in early October; a rise of over 3.5 feet in under three months (Figure 3). Lake stage reached a low of 10.99 feet on May 17 and a high of 16.45 feet on November 12 (post Tropical Storm Eta), a difference of 5.5 feet. Lake stage has declined since mid-November and is currently in the Intermediate sub-band. According to RAINDAR, 0.07 inches of rain fell directly over the Lake through the past week. Areas in the extreme south and immediately north of the Lake received more rainfall (up to 2.0 inches) while the remaining watershed received less than 0.5 inches (Figure 4).

Average daily inflows (excluding rainfall) were lower than the previous week, going from 6,888 cfs to 3,586 cfs. Outflows (excluding evapotranspiration) increased from 4,043 cfs to 5,851 cfs. Most of the inflows came from the Kissimmee River (1,821 cfs through S-65E & S-65EX1), followed by the C-41a canal (510 cfs through S-84 & S-84X), the C-40 and C-41 canals (366 cfs through S-71 & S-72), Fisheating Creek (332 cfs), the C-59 canal (150 cfs through S-191) and from the S-151 structure (99 cfs). Pumps contributed a combined 305 cfs of inflow, a decrease of 438 cfs from the previous week. Releases to the west via S-77 increased from the prior week, going from 3,059 cfs to 4,149 cfs, while releases east via S-308 increased from 984 cfs to 1,576 cfs. Outflows south through the S-350 structures increased from 0 cfs to 126 cfs. Total lake inflows and outflows for the past week are detailed in Table 1, as well as the approximate change in lake stage from each major structure's total flows over the period. Figure 5 shows the combined average daily cfs for inflows and outflows for the Lake over the past eight weeks. These data are provisional and are subject to change.

The most recent satellite image (November 22, 2020) from the NOAA cyanobacteria monitoring product derived from EUMETSAT's Sentinel 3 OLCI sensor data showed no current bloom activity on the Lake, likely due to high winds, heavy rain and residual effects associated with Tropical Storm Eta (Figure 6).

## **Water Management Summary**

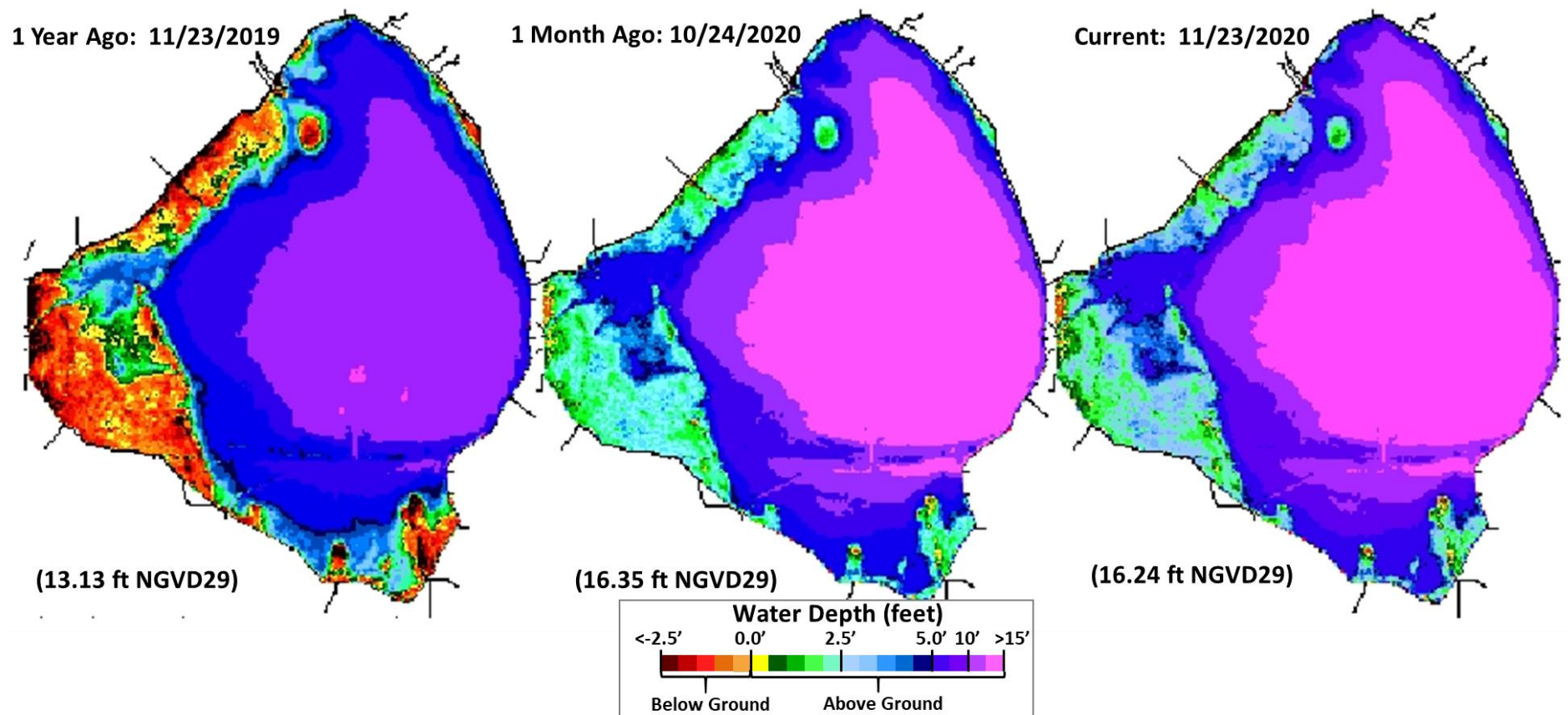
Lake Okeechobee stage was 16.24 feet NGVD on November 23, 2020, 0.17 feet lower than the previous week and 0.11 feet lower than the previous month. Rainfall was much reduced over the past two weeks and inflows declined from a high of over 8,500 cfs on November 11 to less than 4,000 cfs on November 23. Stage has been above or near the top of the envelope since August 1, 2020 and is currently 0.74 feet above. Satellite imagery suggests cyanobacterial bloom potential is low on the lake, likely due to high winds, heavy rain and residual effects associated with Tropical Storm Eta.

**Table 1.** Average daily inflows and outflows and the approximate depth equivalents on Lake Okeechobee for various structures.

INFLOWS	Previous week Avg Daily CFS	Avg Daily Flow cfs	Equivalent Depth Week Total (in)
S-65E & S-65EX1	1984	1821	0.7
S-71 & S-72	861	366	0.1
S-84 & S-84X	1246	510	0.2
Fisheating Creek	462	332	0.1
S-154	188	99	0.0
S-191	1002	150	0.1
S-133 P	238	86	0.0
S-127 P	85	40	0.0
S-129 P	65	26	0.0
S-131 P	33	9	0.0
S-135 P	322	144	0.1
S-2 P	0	0	0.0
S-3 P	0	0	0.0
S-4 P	0	0	0.0
L-8 Backflow	402	4	0.0
Rainfall	1987	196	0.1
<b>Total</b>	<b>8875</b>	<b>3782</b>	<b>1.4</b>

OUTFLOWS	Previous week Avg Daily CFS	Avg Daily Flow cfs	Equivalent Depth Week Total (in)
S-77	3059	4149	1.6
S-308	984	1576	0.6
S-351	0	108	0.0
S-352	0	18	0.0
S-354	0	0	0.0
L-8 Outflow			
ET	1301	1559	0.6
<b>Total</b>	<b>5344</b>	<b>7410</b>	<b>2.8</b>

Provisional Data



**Figure 1.** Water depth estimates on Lake Okeechobee based on the South Florida Water Depth Assessment Tool.

## Lake Okeechobee Stage vs Updated Ecological Envelope

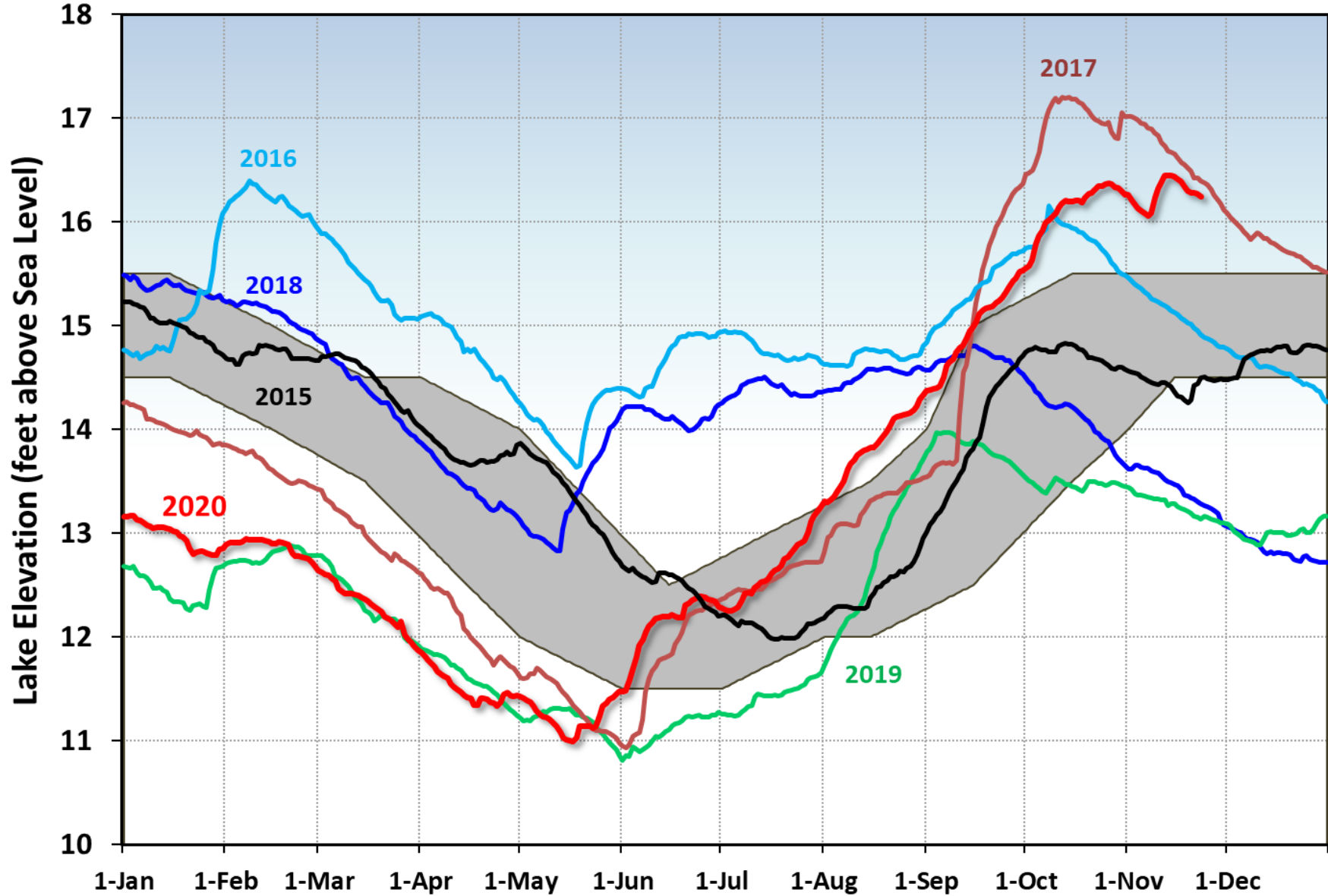
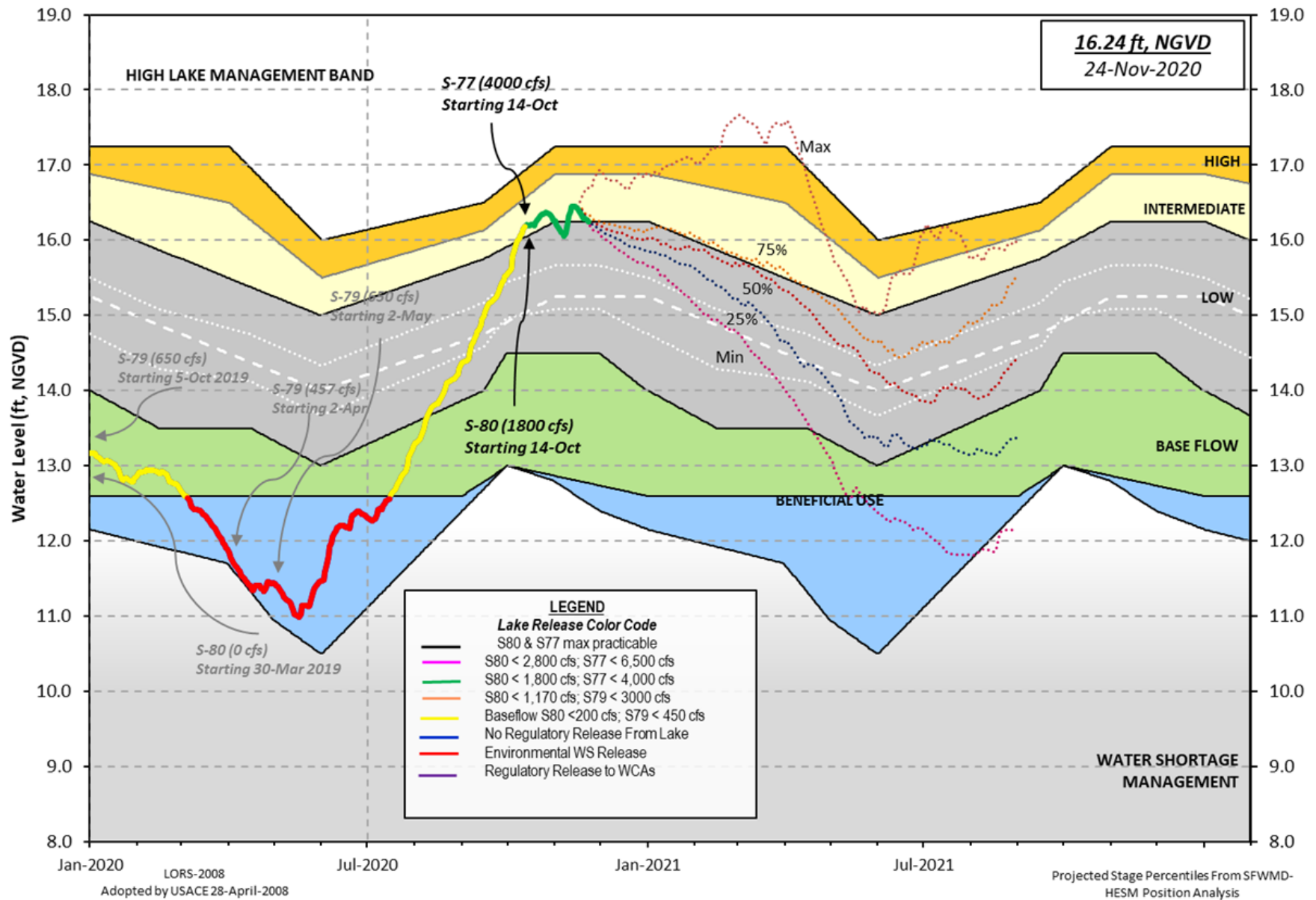


Figure 2. Select annual stage hydrographs for Lake Okeechobee in comparison to the updated Ecological Envelope.

## Lake Okeechobee Water Level History and Projected Stages



**Figure 3.** Recent Lake Okeechobee stage and releases, with projected stages based on a dynamic position analysis.

SFWMD PROVISIONAL RAINDAR 7-DAY BASIN RAINFALL ESTIMATES  
FROM: 0700 EST, 11/17/2020 THROUGH: 0700 EST, 11/24/2020

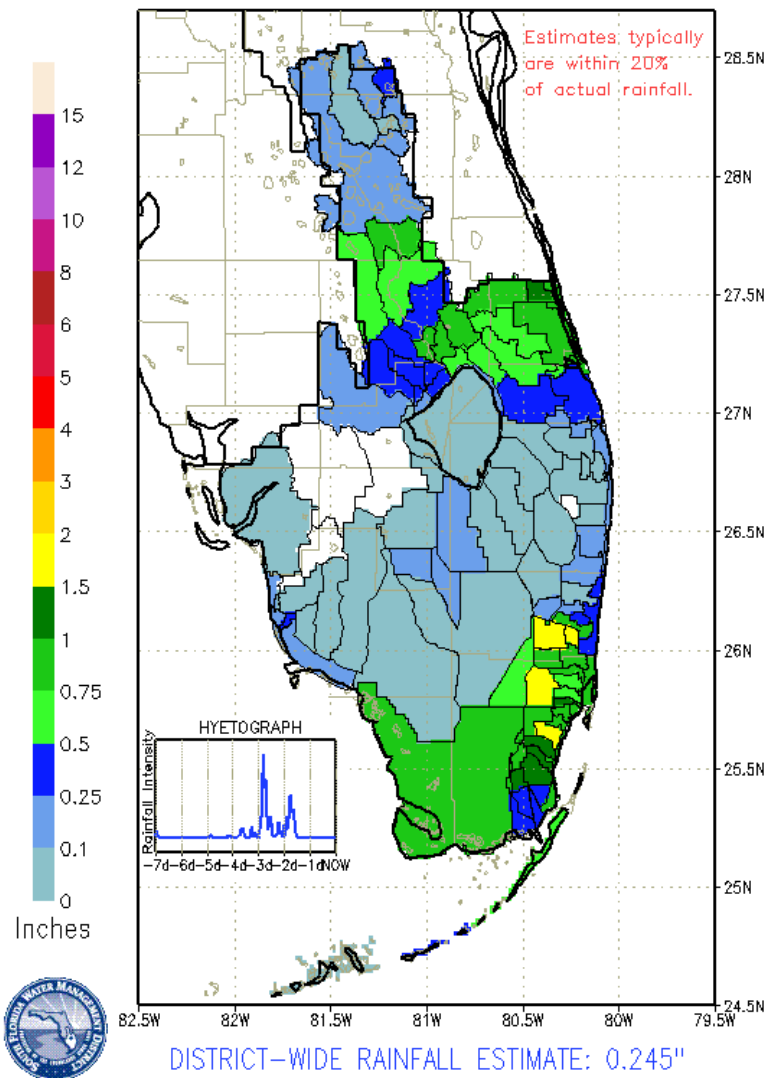


Figure 4. 7-Day rainfall estimates by RAINDAR.

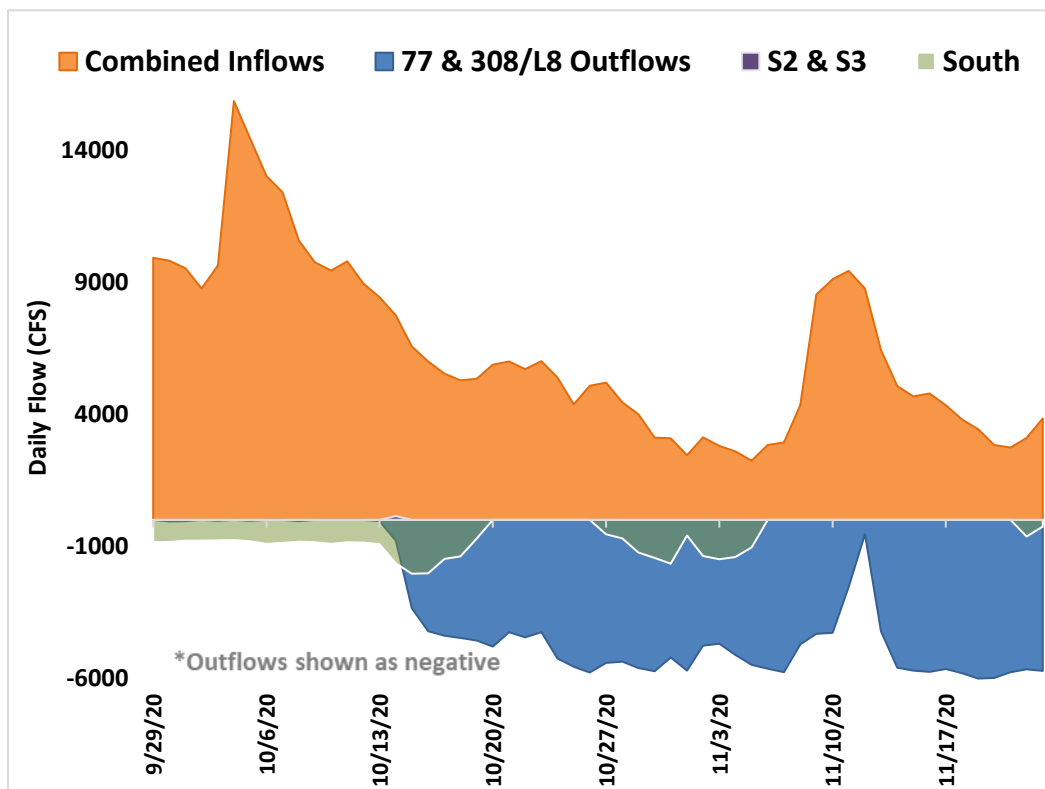
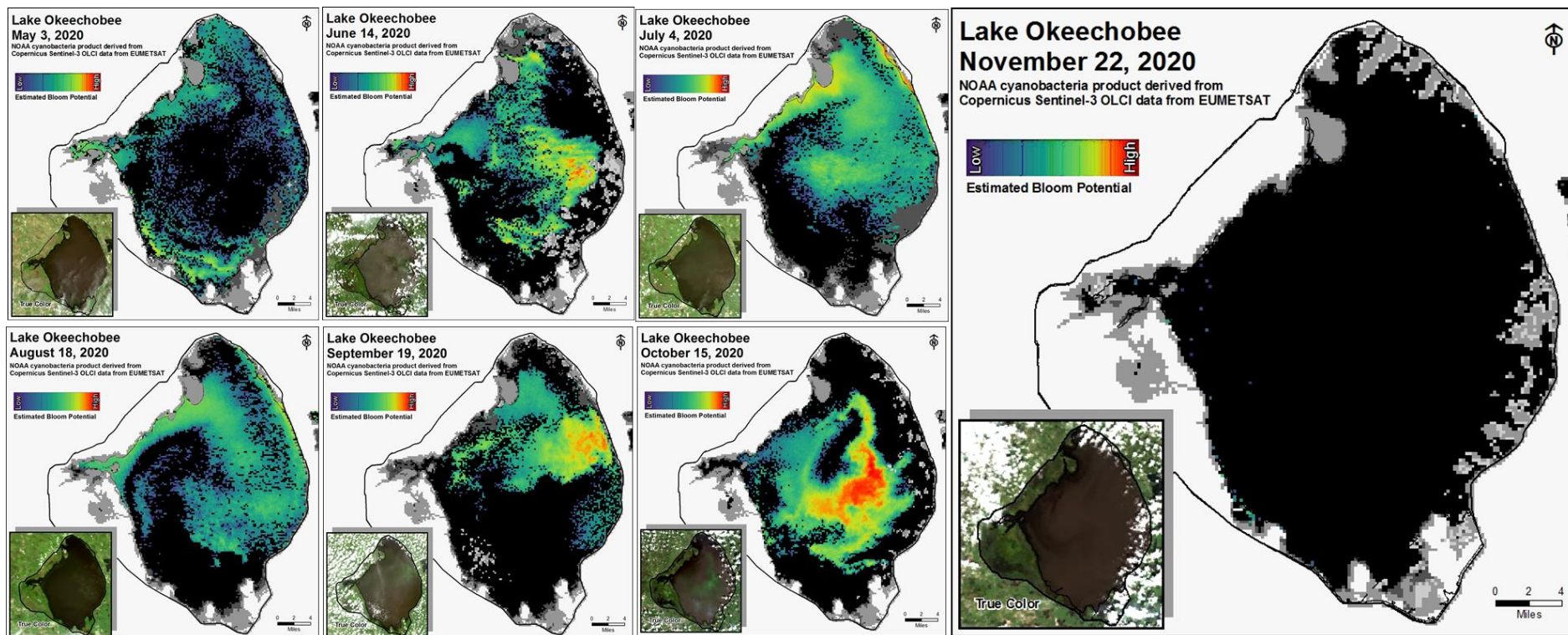


Figure 5. Major inflows (orange) and outflows (blue) of Lake Okeechobee, including the S-350 structures designated as South (green). The L-8 Canal flows through Culvert 10A are included as outflows when positive, and as inflows when backflowing into the Lake. All inflows and outflows are shown as positive and negative, respectively, for visual purposes. Outflows through the S-77 and S-308 structures are shown based on their downstream gauges to account for lock openings for navigation.



**Figure 6.** Cyanobacteria bloom potential based on NOAA's harmful algal bloom monitoring system. Gray color indicates cloud cover.

## **ESTUARIES**

### **St. Lucie Estuary:**

Last week total inflow to the St. Lucie Estuary averaged more than 3,483 cfs (Figures 1 and 2) and last month inflow averaged more than 4,993 cfs. Note these numbers do not include contributions from the Gordy Road Structure due to missing data. Last week's provisional averaged inflows from the tidal basin and the structures are shown in Table 1. (Note: Recorder at Gordy Road structure was removed due to bridge construction)

**Table 1.** Weekly average inflows (data are provisional).

<b>Location</b>	<b>Flow (cfs)</b>
Tidal Basin Inflow	520
S-80	2131
S-308	1573
S-49 on C-24	434
S-97 on C-23	398
Gordy Rd. structure on Ten Mile Creek	Not reporting

Over the past week in the estuary, salinity remained the same at HR1 and increased at US1 Bridge and downstream (Table 2, Figures 3 and 4). The seven-day moving average of the water column (an average of the surface and bottom salinity) at the US1 Bridge is 1.1. Salinity conditions in the middle estuary are estimated to be within the poor range for adult eastern oysters (Figure 3).

**Table 2.** Seven-day average salinity at three monitoring sites in the St. Lucie Estuary. Current average is in bold face type, previous average in parentheses. The envelope reflects the preferred salinity range for adult eastern oysters (*Crassostrea virginica*) in the middle estuary.

<b>Sampling Site</b>	<b>Surface</b>	<b>Bottom</b>	<b>Envelope</b>
HR1 (North Fork)	<b>0.2</b> (0.2)	<b>0.2</b> (0.2)	NA <sup>1</sup>
US1 Bridge	<b>0.5</b> (0.2)	<b>1.6</b> (0.2)	10.0-26.0
A1A Bridge	<b>7.1</b> (3.1)	<b>17.6</b> (8.0)	NA <sup>1</sup>

<sup>1</sup>Envelope not applicable

### **Caloosahatchee Estuary:**

Last week total inflow to the Caloosahatchee Estuary averaged approximately 7,036 cfs (Figures 5 and 6) and last month inflow averaged about 7,667 cfs. Last week's provisional averaged inflows from the structures and the tidal basin are shown in Table 3.

**Table 3.** Weekly average inflows (data is provisional).

<b>Location</b>	<b>Flow (cfs)</b>
S-77	4,150
S-78	4,033
S-79	5,885
Tidal Basin Inflow	1,152

Over the past week in the estuary, salinity remained about the same to Cape Coral Bridge and decreased downstream (Table 4, Figures 7 & 8). The seven-day average salinity values are within the poor range for adult eastern oysters at Cape Coral and in the good range at Shell Point and at Sanibel (Figure 9). The seven-day average surface salinities (Table 4) are in the good range (0-10) for tape grass at Val I-75 and at Ft. Myers.

**Table 4.** Seven-day average salinity at six monitoring stations in the Caloosahatchee Estuary. Current average is in bold, previous average in parentheses. The envelope at Val I-75 is for the protection of tape grass in the upper estuary and the envelope in the lower estuary reflects the preferred salinity range for adult eastern oysters (*Crassostrea virginica*).

Sampling Site	Surface	Bottom	Envelope
S-79 (Franklin Lock)	<b>0.2</b> (0.2)	<b>0.2</b> (0.2)	NA <sup>1</sup>
Val I75	<b>0.2</b> (0.2)	<b>0.2</b> (0.2)	0.0-5.0 <sup>2</sup>
Ft. Myers Yacht Basin	<b>0.2</b> (0.2)	<b>0.2</b> (0.2)	NA
Cape Coral	<b>1.3</b> (1.1)	<b>2.1</b> (1.9)	10.0-30.0
Shell Point	<b>12.3</b> (15.0)	<b>16.0</b> (17.9)	10.0-30.0
Sanibel	<b>22.9</b> (26.1)	<b>24.7</b> (28.2)	10.0-30.0

<sup>1</sup>Envelope not applicable and <sup>2</sup>Envelope is based on a 2-week forecast 30-day average

Forecast of surface salinity (Table 5 and Figure 10) at Val I-75 for the next two weeks using the autoregression model (Qiu and Wan, 2013) coupled with a linear reservoir model for the tidal basin predicts daily salinity to be 0.3 or lower at the end of the two week period for pulse release at S-79 ranging from 0 to 800 cfs and estimated Tidal Basin inflows of 530 cfs. The 30-day moving average surface salinity at Val I-75 is forecast to be 0.3 or lower (Table 5). The current salinity conditions at Val I-75 are within the envelope of salinity 0.0-5.0 for this site (Table 4).

**Table 5.** Predicted salinity at Val I-75 at the end of forecast period

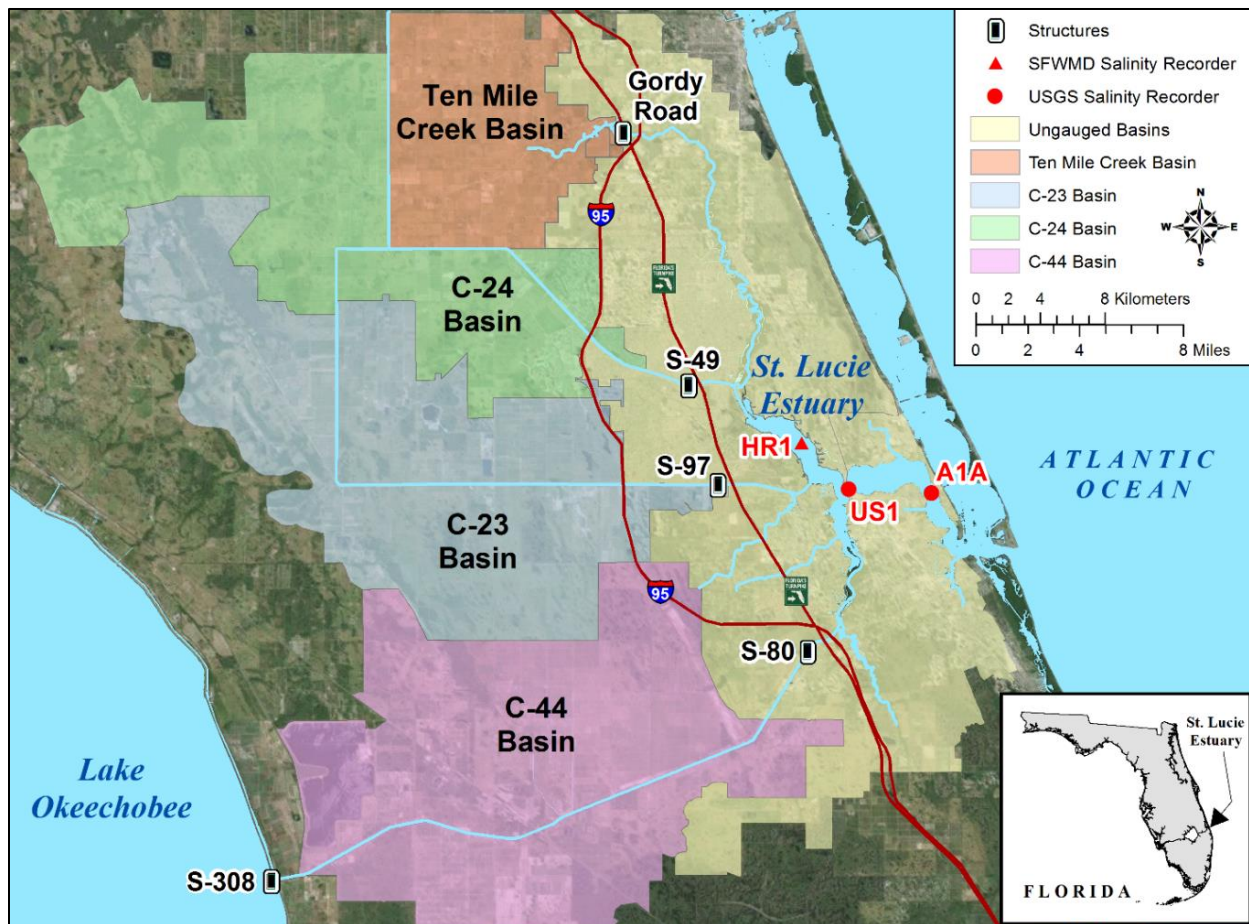
Scenario	Q79 (cfs)	TB runoff (cfs)	Daily salinity	30 day Mean
A	0	530	0.3	0.3
B	300	530	0.3	0.3
C	450	530	0.3	0.3
D	650	530	0.3	0.3
E	800	530	0.3	0.3

### Red tide

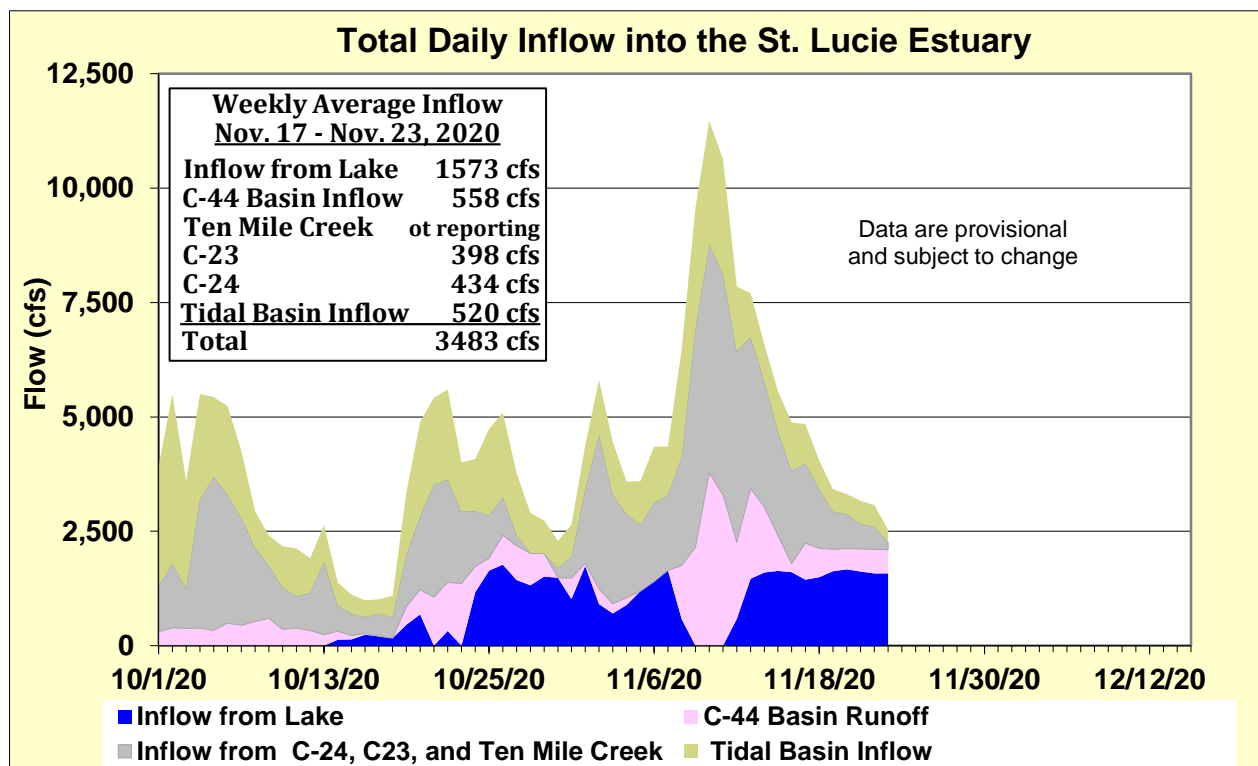
The Florida Fish and Wildlife Research Institute reported on November 20, 2020, that *Karenia brevis*, the Florida red tide dinoflagellate, was not observed in samples collected from Lee or Miami-Dade counties (no samples were analyzed this week from St. Lucie, Martin, Palm Beach or Broward counties).

### Water Management Recommendations

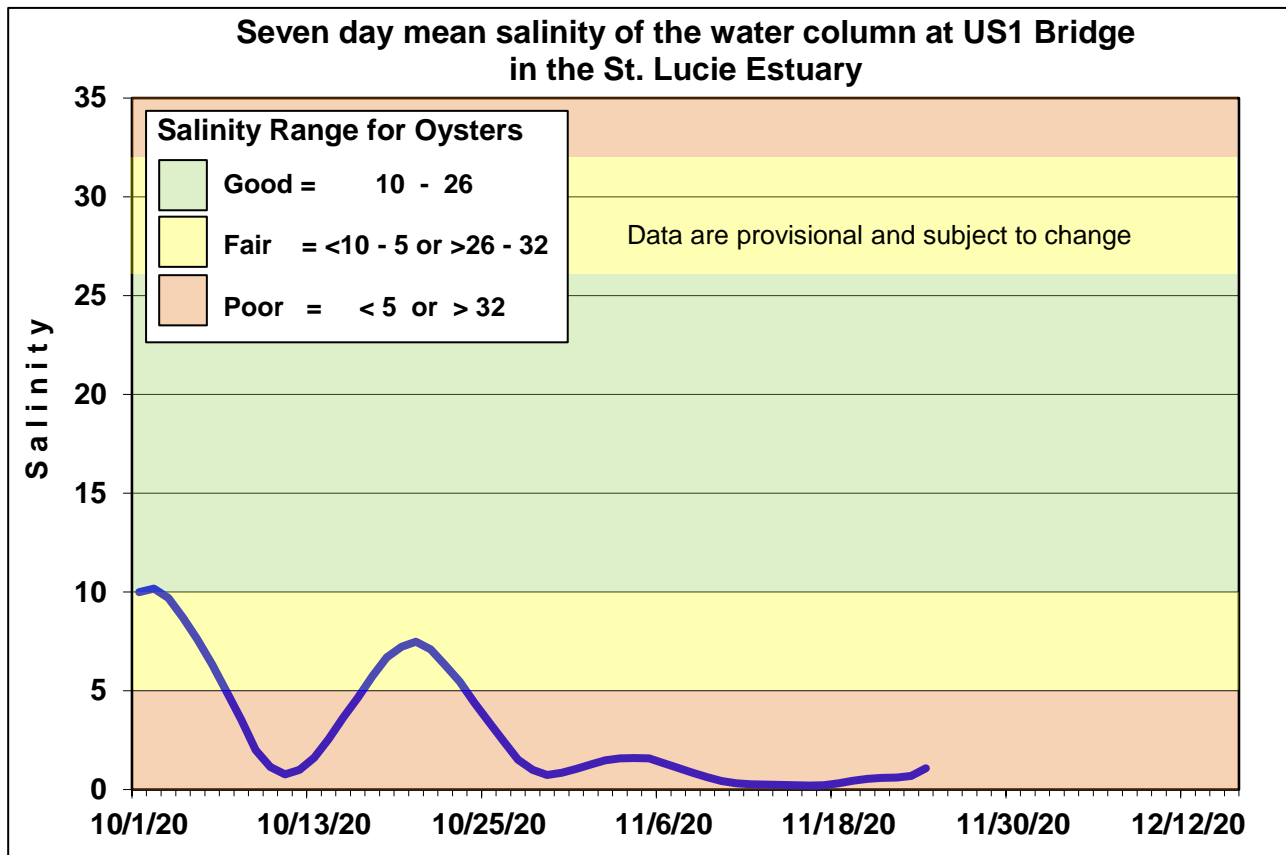
Lake stage is in the Intermediate Sub-Band. Tributary conditions are very wet. The LORS2008 release guidance suggests up to 4000 cfs release at S-79 to the Caloosahatchee Estuary and up to 1800 cfs release at S-80 to the St. Lucie Estuary.



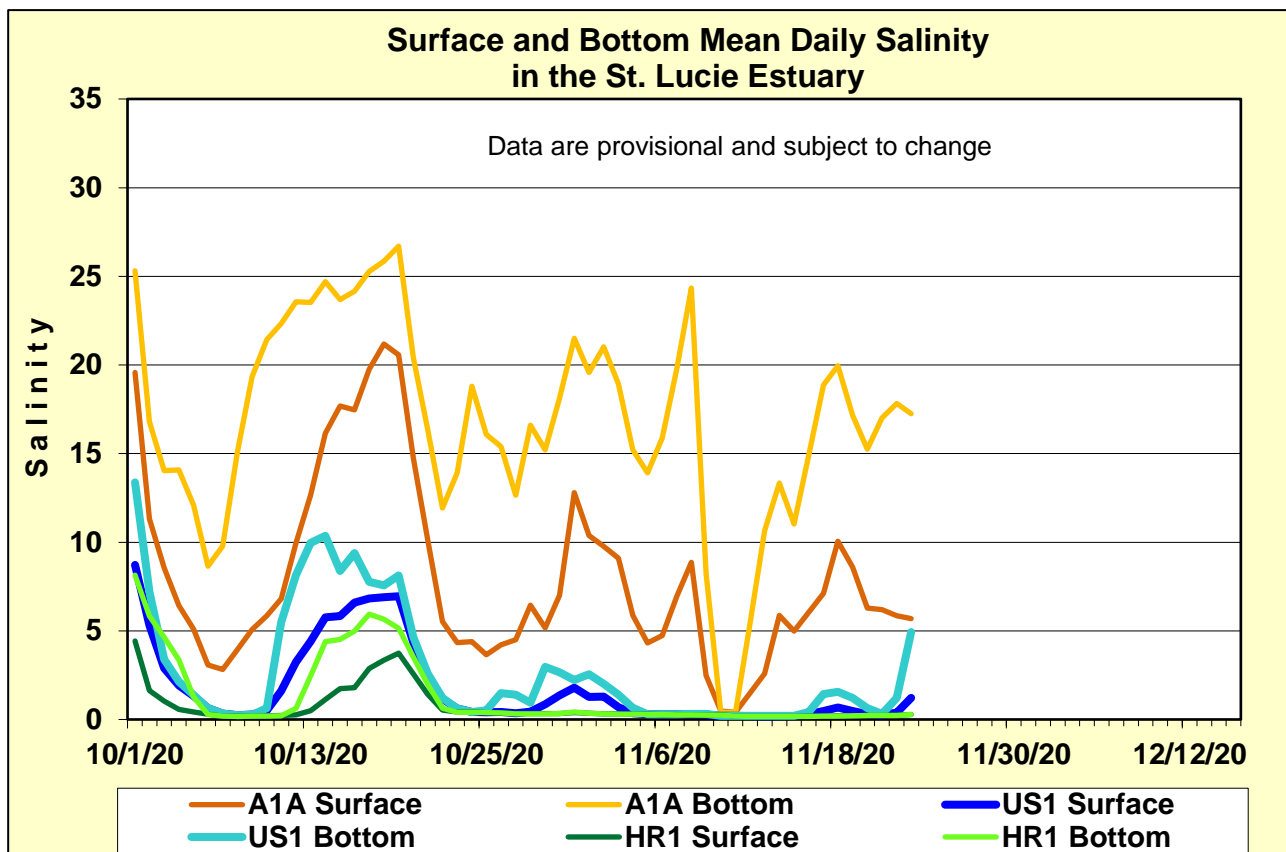
**Figure 1.** Basins, water control structures, and salinity monitoring for the St. Lucie Estuary.



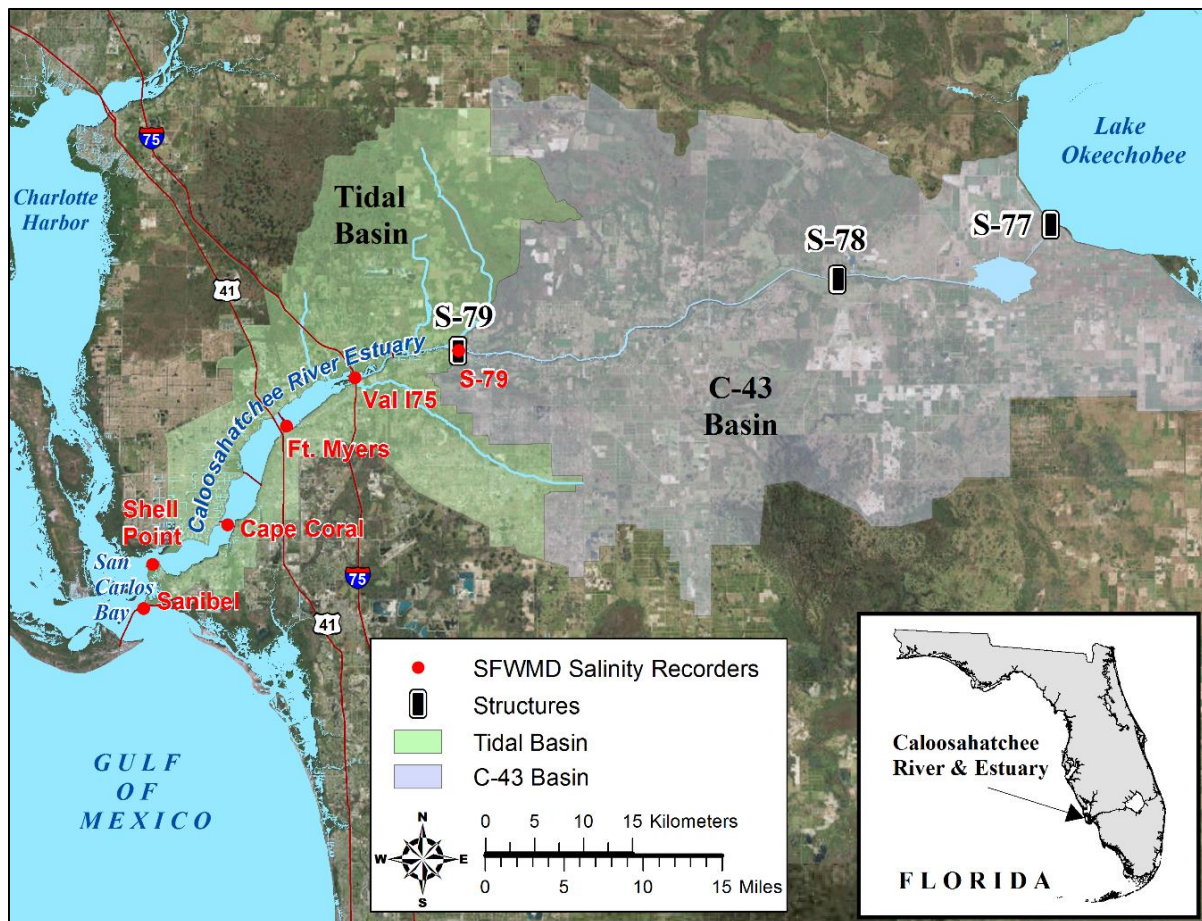
**Figure 2.** Total daily inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and tidal basin into the St. Lucie Estuary.



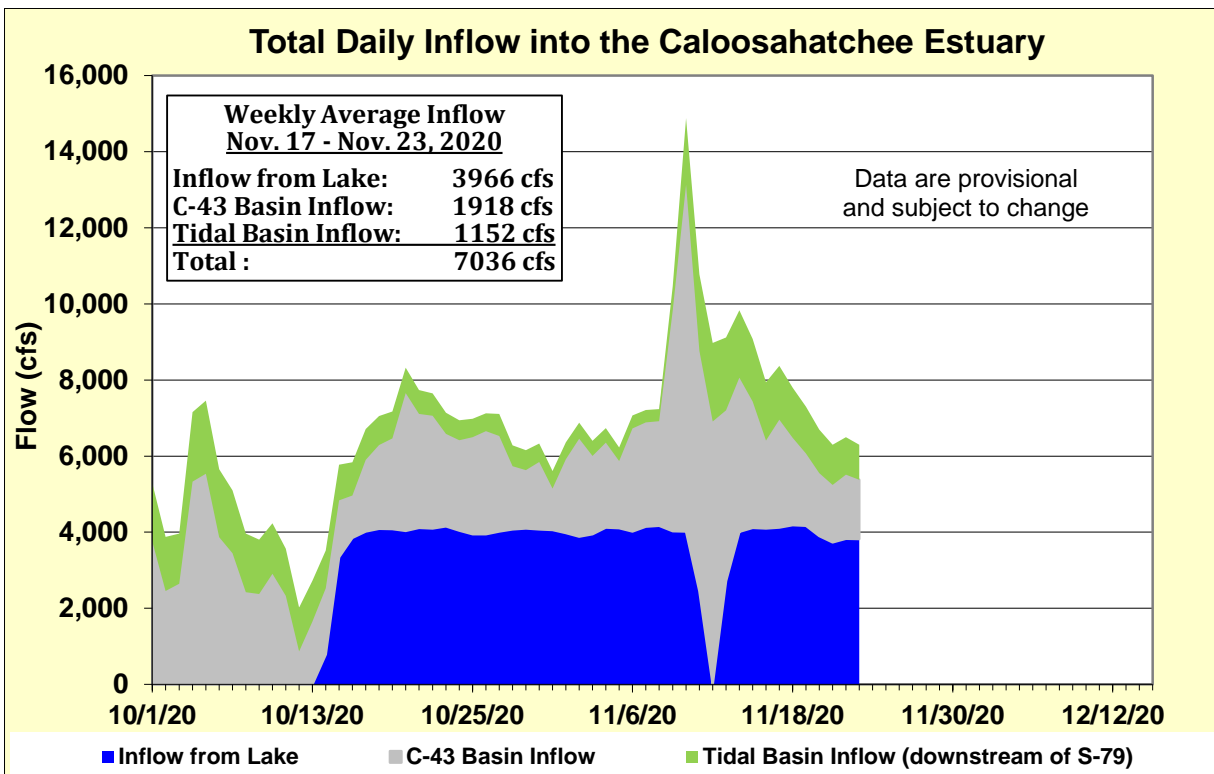
**Figure 3.** Seven-day mean salinity of the water column at the US1 Bridge.



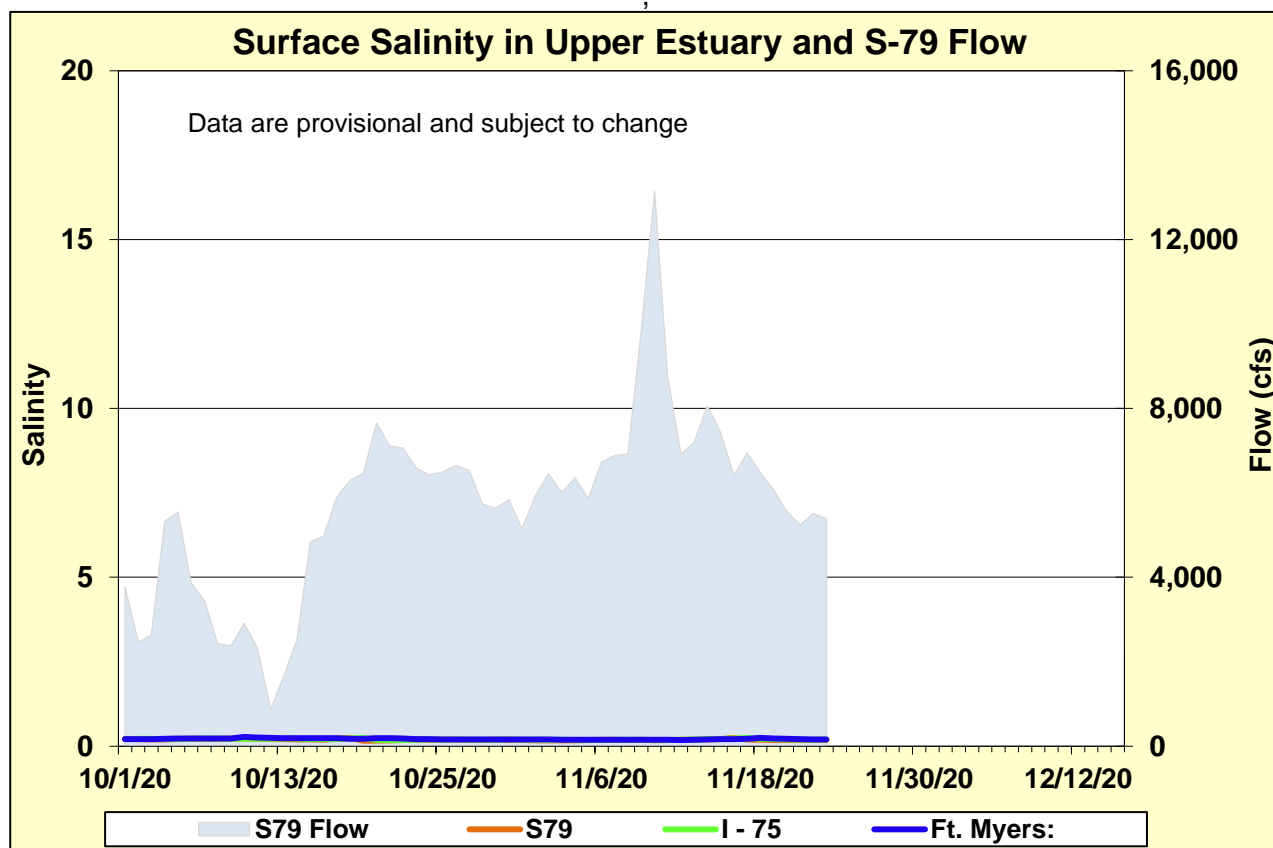
**Figure 4.** Daily mean salinity at the A1A, US1, and HR1 stations.



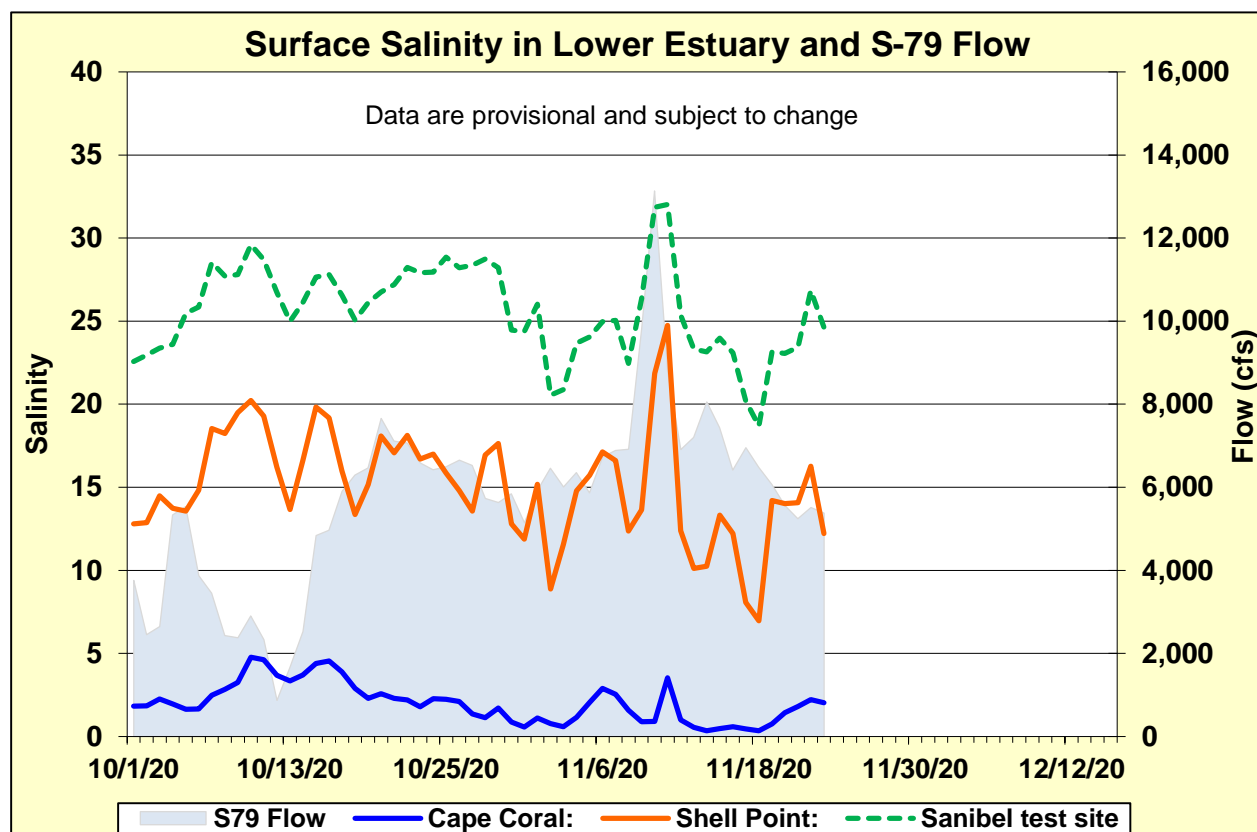
**Figure 5.** Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.



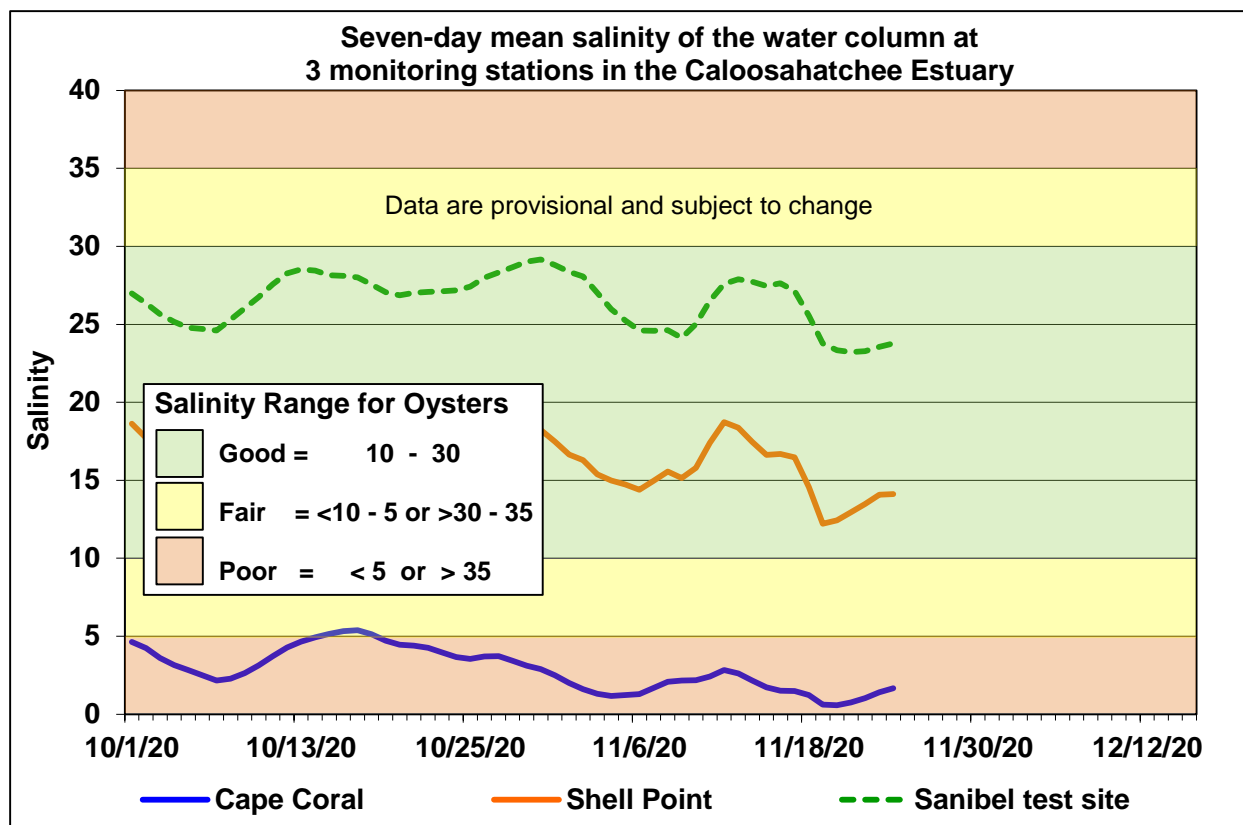
**Figure 6.** Total daily inflows from Lake Okeechobee, runoff from the C-43 basin



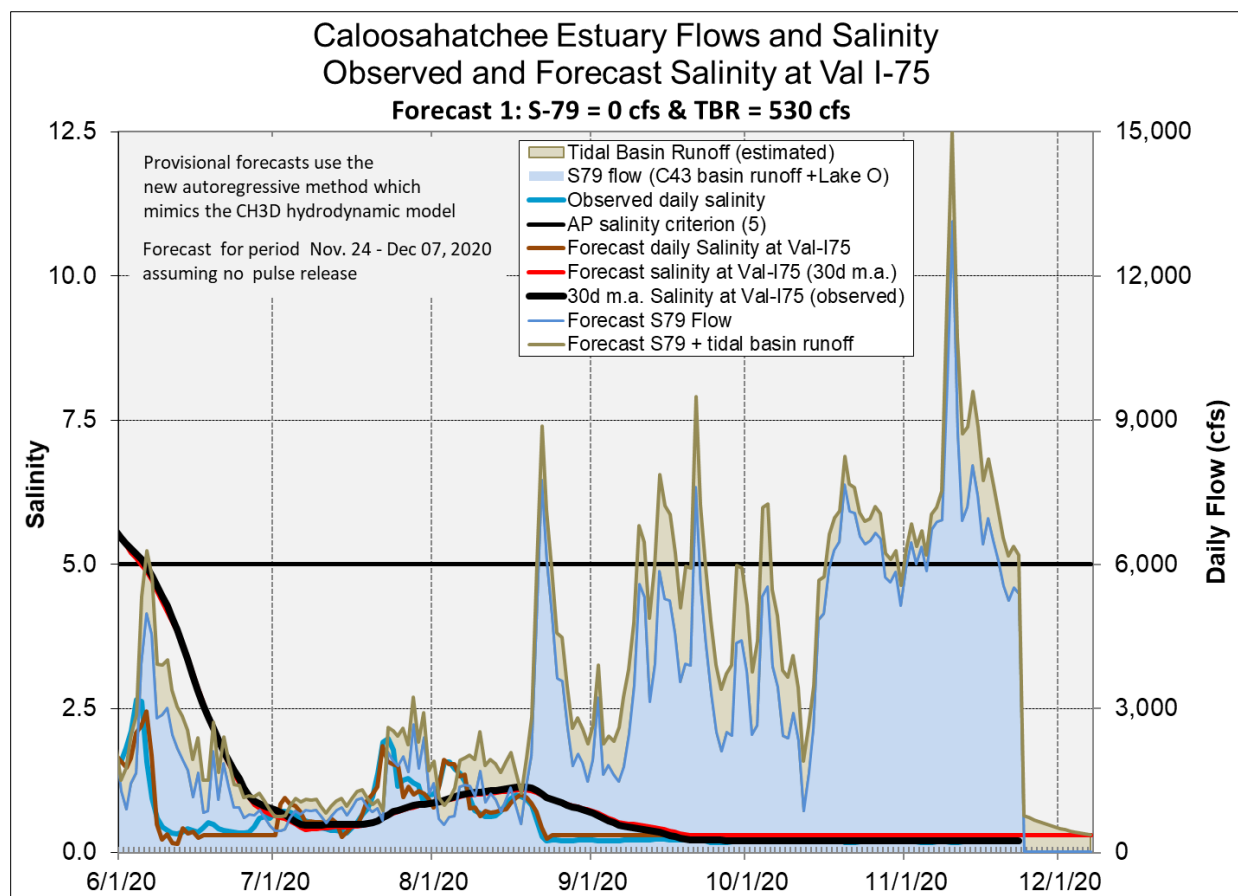
**Figure 7.** Daily mean flows at S-79 and salinity at upper estuary monitoring stations.



**Figure 8.** Daily mean flows at S-79 and salinity at lower estuary stations.



**Figure 9.** Seven-day mean salinity at Cape Coral, Shell Point, and Sanibel monitoring stations.

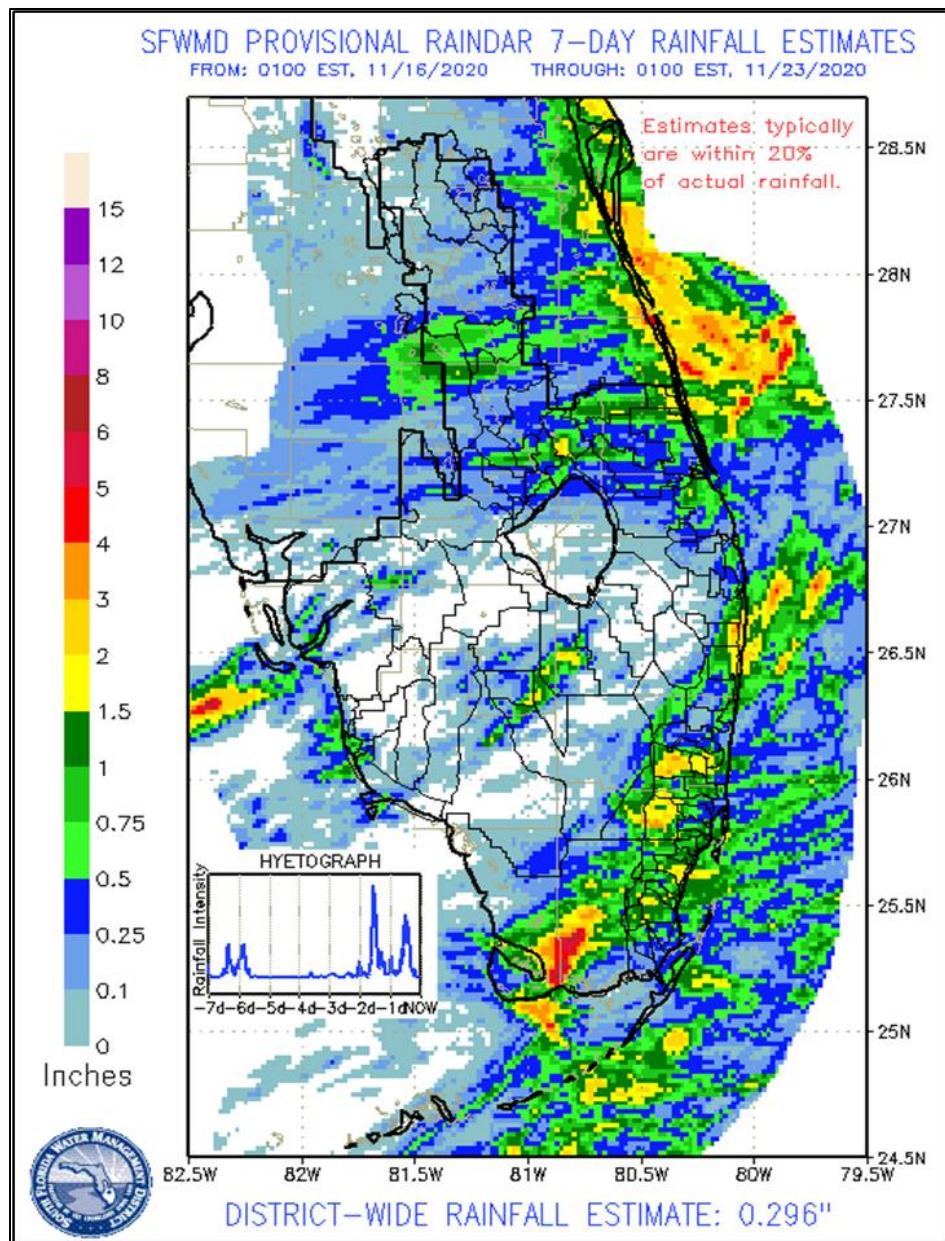


**Figure 10.** Forecasted Val I-75 surface salinity assuming no pulse release at S-79.

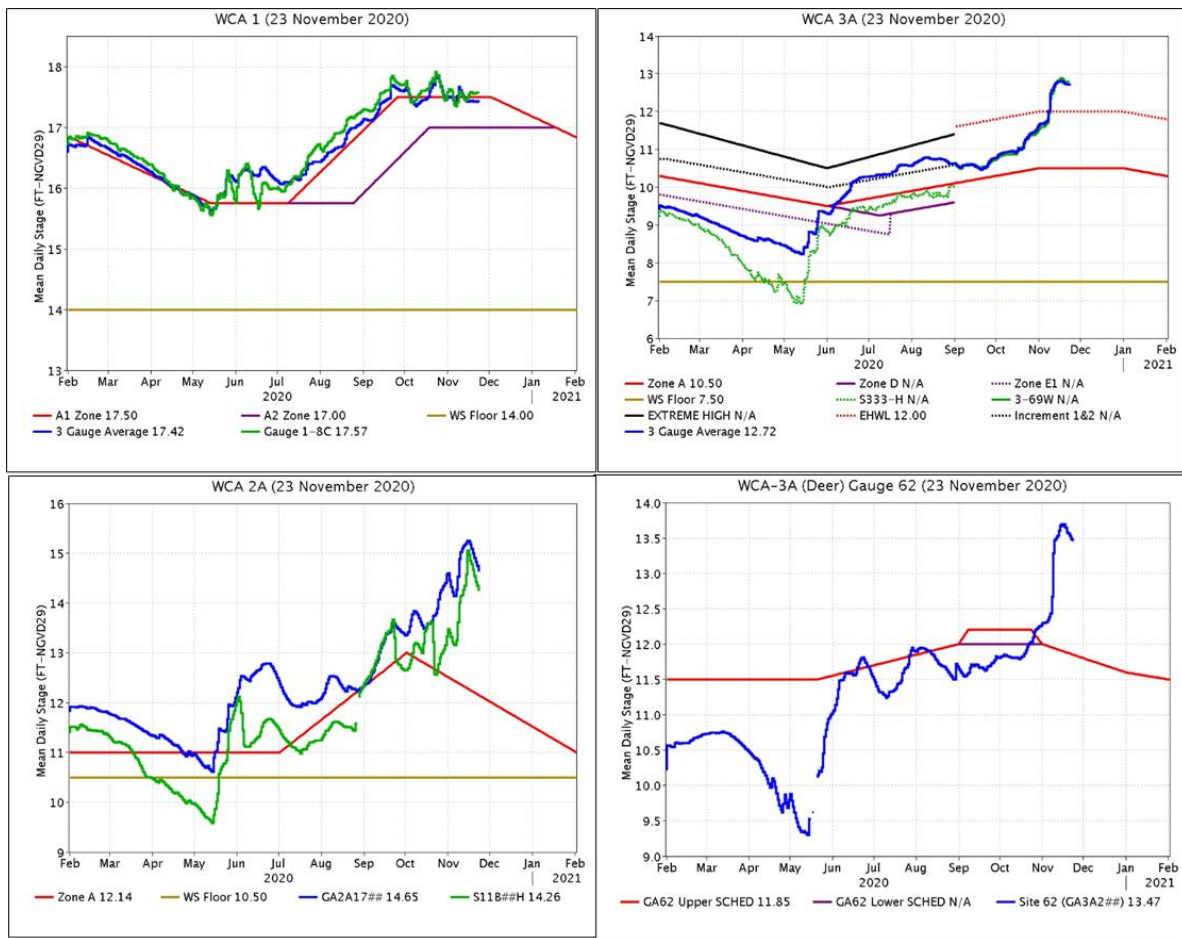
## **EVERGLADES**

A welcome break from rainfall with higher amounts in the south, very low in WCA-1. At the gauges monitored for this report stages fell 0.10 feet on average. Evaporation was 0.78 inches last week, and the TTFF continues to call for maximum releases from WCA-3A.

<b>Everglades Region</b>	<b>Rainfall (Inches)</b>	<b>Stage Change (feet)</b>
WCA-1	0.09	+0.01
WCA-2A	0.33	-0.55
WCA-2B	0.48	-0.18
WCA-3A	0.13	-0.10
WCA-3B	0.88	-0.03
ENP	0.93	-0.06



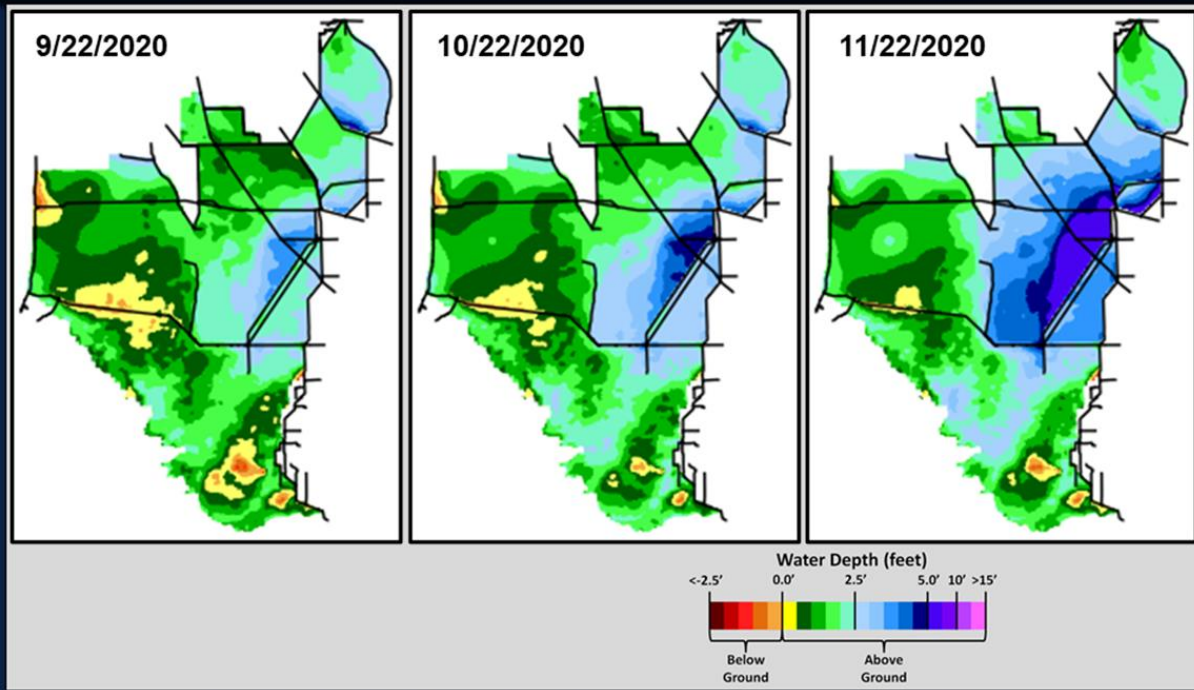
Regulation Schedules: WCA-1: Stage at the 1-8C Gauge is generally trending along with schedule, currently 0.07 feet above the stable Zone A1 regulation line. WCA-2A: Stages at Gauge 2-17 receded towards the regulation line last week and is now 2.53 feet above the falling schedule. WCA-3A: The Three Gauge Average stages receded slightly towards the stable Zone A regulation line last week, currently 2.22 feet above it and 0.72 feet above the EHWL. WCA-3A: Stage at gauge 62 (Northwest corner) receded last week remaining above the falling Upper Schedule by 1.62 feet.



Water Depths: The WDAT tool for spatial interpolation of depth monthly snapshots over the last two months indicate current depths in excess of 5.0 feet in WCA-3A South around the upper reaches of the L-67 canal, southern WCA-2B and extreme southwestern WCA-2A. Ponding depths (>2.5 feet) are found across all of WCA-2A, the south side is much deeper and only the northwest corner of WCA-3A has the potential to be lower than 2.5 feet. Hydrologic connectivity is well established within the major sloughs in ENP and the depths have increased west of the L-28S levee, though the potential remains for below ground stages in southern BCNP.



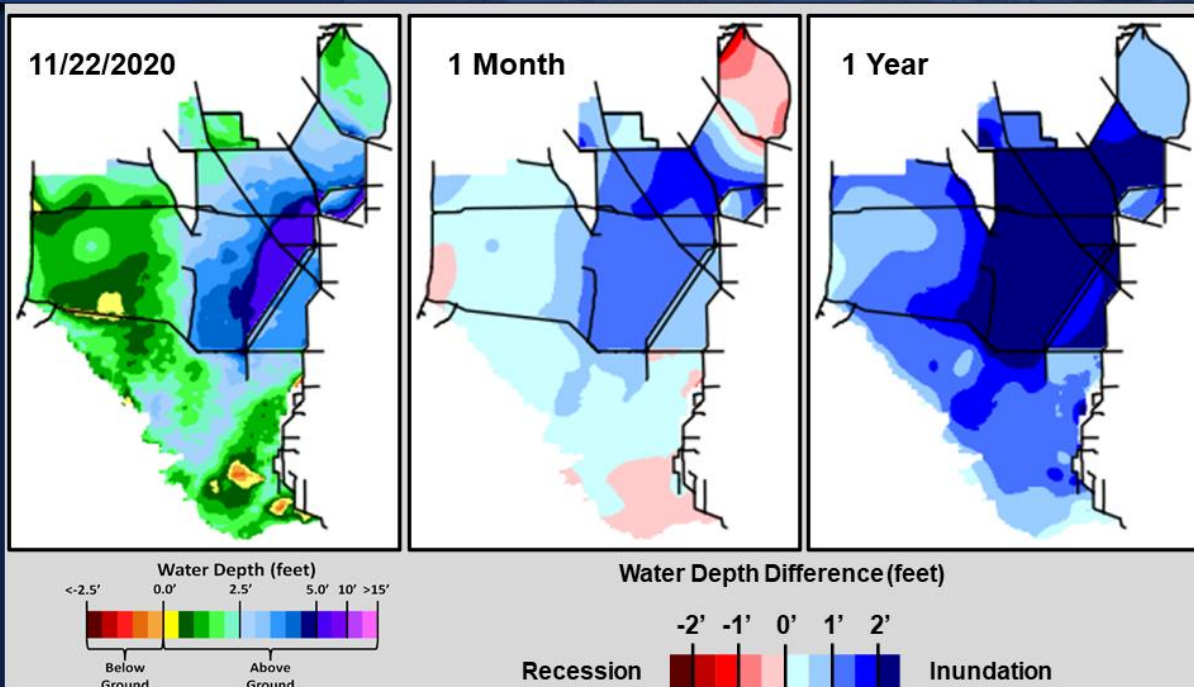
## SFWDAT Water Depth Monthly Snapshots



South Florida Water Depth Assessment Tool (SFWDAT)



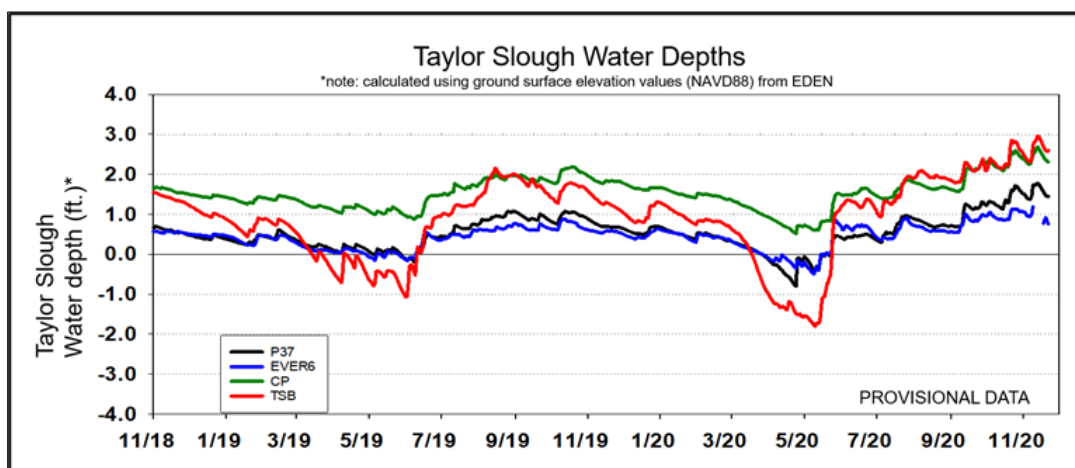
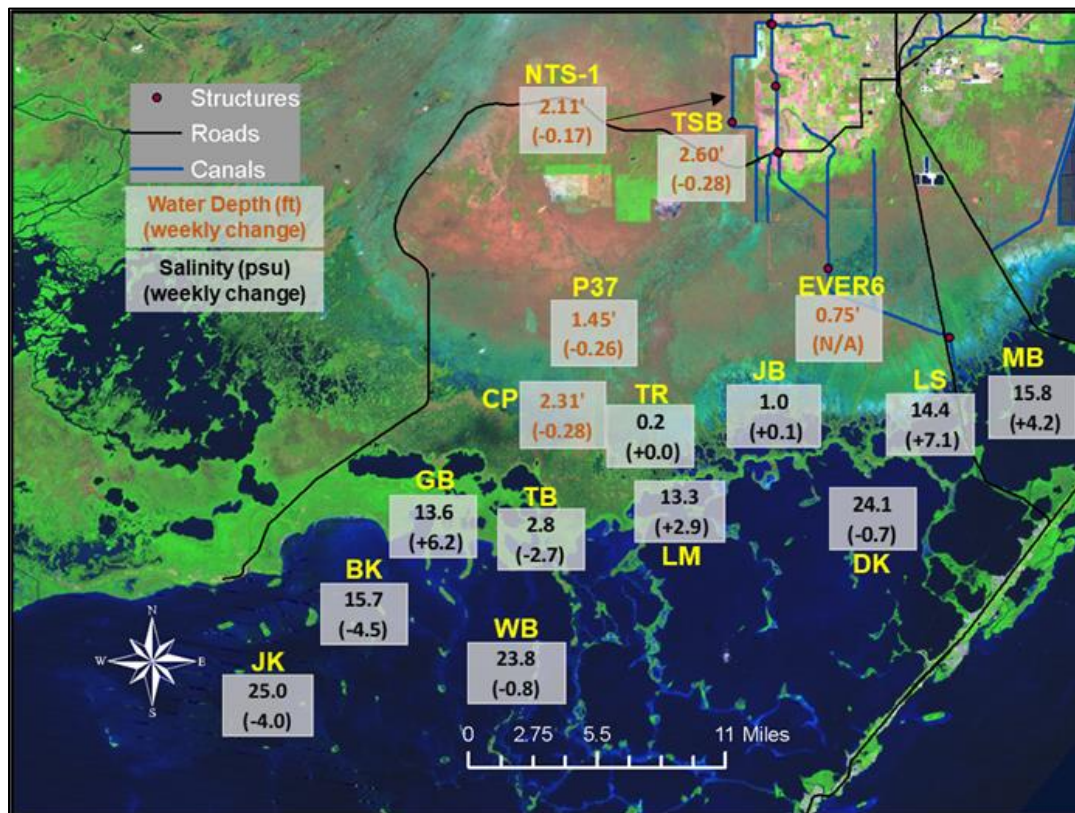
## SFWDAT Everglades Difference Maps (Present – Past)

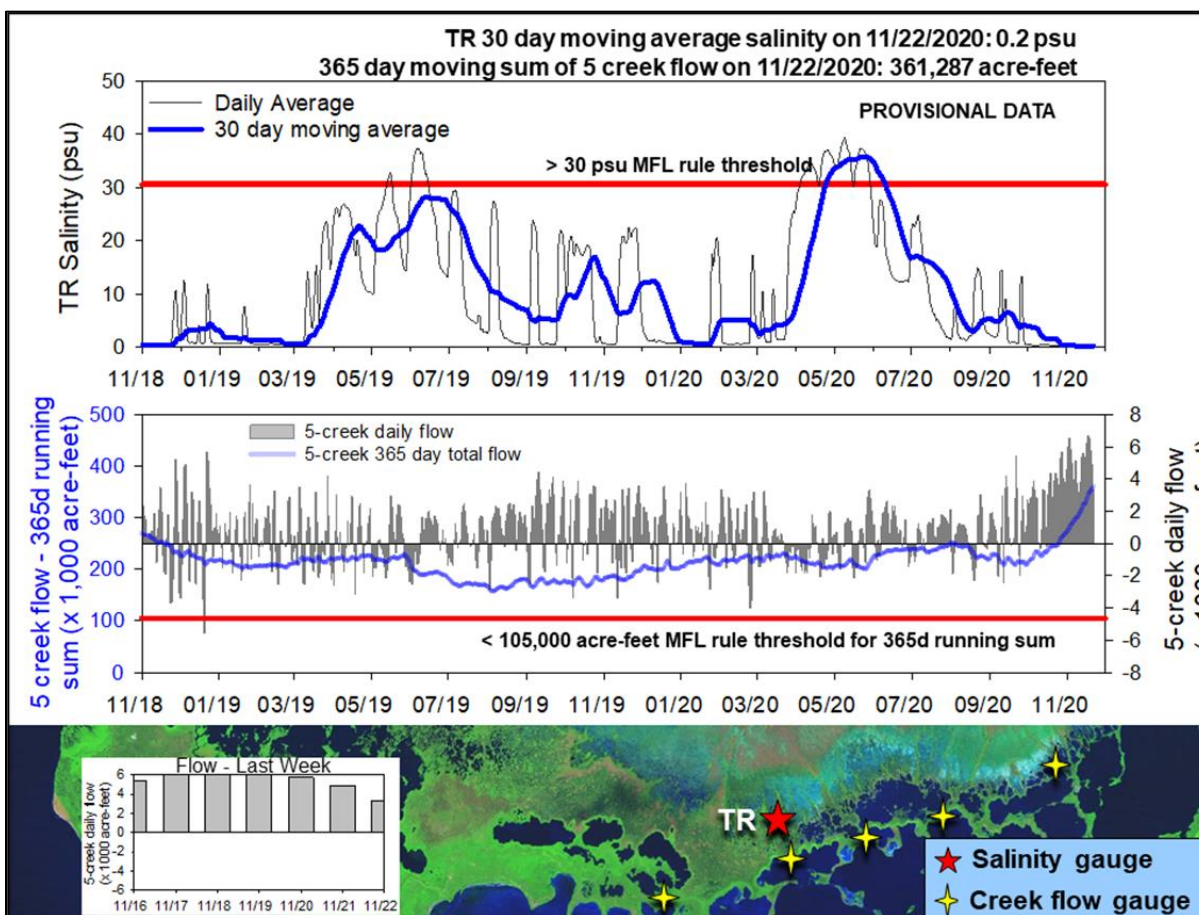
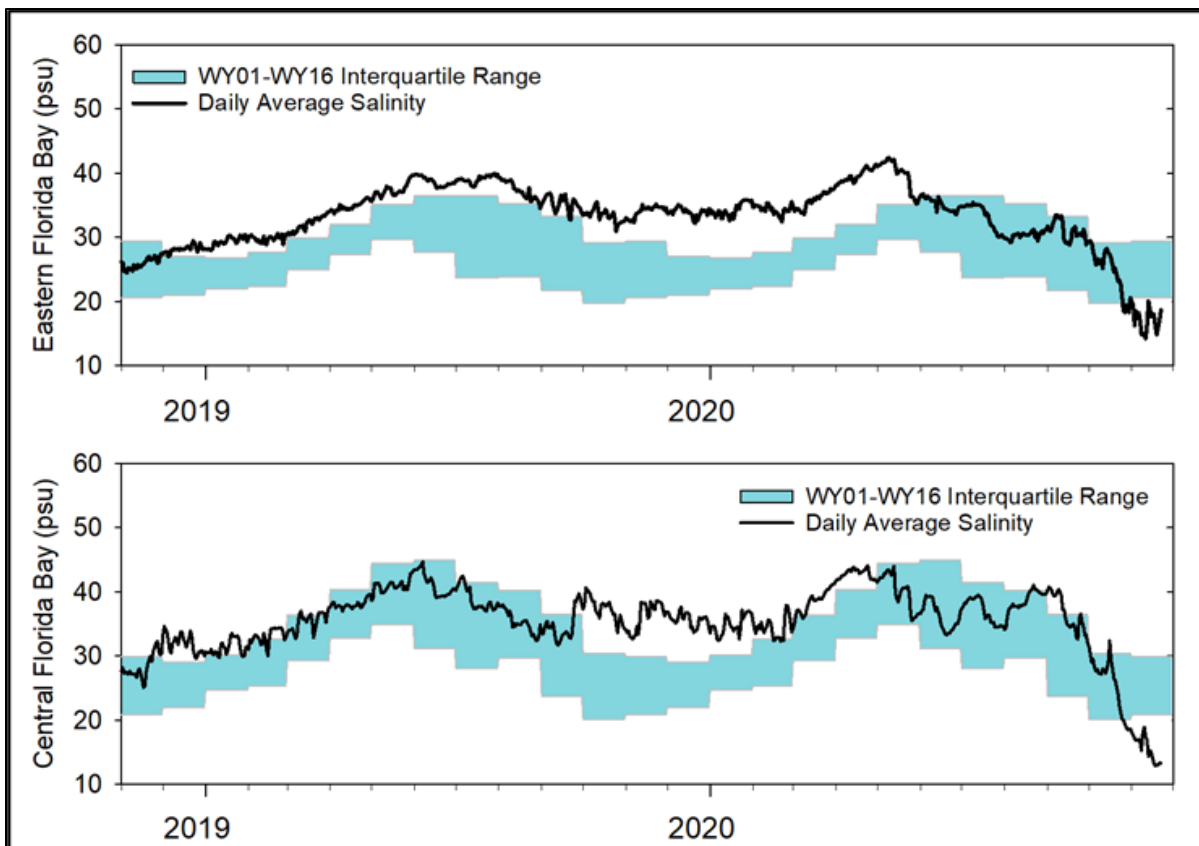


South Florida Water Depth Assessment Tool (SFWDAT)

Tree island inundation in WCA-3A, WCA-3B and ENP: 371 Tree Islands of known elevation within WCA-3A, -3B, and Everglades National Park's Shark Slough. Current preliminary estimates using WDAT indicate that 91% or 336 of the tree islands are currently inundated, the same as the week prior. Initial islands inundated beginning 5/24/20, longest duration of continuous inundation is 172 days. Inundation for more than 90 days has the potential for ecological harm. Inundation for more than 120 days will cause ecological harm to sensitive islands (now 27% of islands).

Taylor Slough Water Levels: An average of 0.4 inches of rain fell over Taylor Slough and Florida Bay this past week which allowed stages to decrease 0.25 feet on average over the week. Current levels in northern Taylor Slough are similar to the fall of 2017 after Hurricane Irma. The area is currently 11 inches above the historical average for this time of year.





Florida Bay Salinities: Salinities in Florida Bay averaged a 0.4 psu increase over the week as bay-wide salinities stabilized after the large influx of freshwater over the previous weeks. Average salinity for the Bay is 10 psu lower than the historical average for this time of year. Manatee Bay (MB) salinity is still depressed due to the flows from S-197, but it has increased 4 psu since last week while flows are still similar suggesting that the water column is mixing.

Florida Bay MFL: The salinity at the TR station in the mangrove zone (tracked for the Florida Bay MFL) has continued to be near fresh (less than 0.3 psu) and the 30-day moving average is also low at 0.2 psu. Weekly flow from the 5 creeks identified by yellow stars on the map totaled almost 39,000 acre-feet with another full week of positive flow. This is the highest weekly total so far this water year. The 365-day moving sum of flow from the five creeks (tracked as part of the Florida Bay MFL criteria) ended at 361,287 acre-feet this week which is a 34,000 acre-foot increase from last week. That is higher than the 75th percentile of historical data (313,052 acre-feet). This is a value not seen since October of 2018. Creek flows are provisional USGS data.

### **Water Management Recommendations**

Initiating a recession where possible in WCA-2A or WCA-3A even when faster than traditional ecological recommendations (i.e. between -.05 and -.09 feet per week) has ecological benefit as long as there is no downstream deleterious ecological impact. Moderating rapid changes in stage to less than plus or minus 0.25 feet per week or 0.50 feet per two weeks has ecological benefit. Extreme high-water conditions call for the utilization of any and all sources of discharge from WCA-2A and WCA-3A.

Tens of thousands of wading birds were observed feeding in the far southwest of the greater Everglades system. October's peak stages in northern WCA-3A suggest success for next season's wading bird nesting at the Alley north colony by providing adequate surface water that can protect it from terrestrial predators during the nesting season. In order to optimize foraging conditions for wading birds a recession would ideally begin soon.

Ponding along the L-67 canal/levee system has increased and inundation of the tree islands in that region and east into central WCA-3A South has now persisted for more than 120 days which creates ecological harm in regions containing sensitive islands. Managing inflows/outflows within that region that decreases ponding in both spatial extent and the amount of time the region is inundated has benefit to the ecology of tree islands. When considering the ecology of tree islands in WCA-3A as a whole, the last two years of low flooding stress create a resilience to flooding stress for a single wet season. If these high stages were to persist long into the dry season, ecological harm is likely, but given the low precipitation predictions for the upcoming dry season this persistence seems unlikely and why at this time SFWMD Everglades ecologists are recommending a careful conservation of water in WCA-3A, once conditions allow for a dry season recession to begin.

Continued flows towards Taylor Slough and Florida Bay maintain hydration in the marshes and lower salinity conditions within the nearshore areas of Florida Bay and will provide a freshwater buffer against the drier than average dry season that is expected which would delay the start of the salinity increases that occur within the dry season and possibly prevent the occurrence of extreme hyper-salinity towards the end of the dry season.

More specific recommendations appear in the summary table below. The red text represents new or modified information or recommendations.

### SFWMD Everglades Ecological Recommendations, November 24th, 2020 (red is new)

Area	Weekly change	Recommendation	Reasons
WCA-1	Stage increased by 0.01'	Maintain marsh stage slightly above and parallel to the regulation schedule.	Protect within basin and downstream habitat and wildlife.
WCA-2A	Stage decreased by 0.55'	Maintain and moderating the recession rate to maintain marsh stage parallel to the falling regulation schedule.	Protect within basin and downstream habitat and wildlife from flooding stress.
WCA-2B	Stage decreased by 0.18'	Maintain and moderate the recession rate to lower marsh stage.	Protect within basin and downstream habitat and wildlife from flooding stress.
WCA-3A NE	Stage decreased by 0.26'	Maintain and moderate the recession rate to return marsh stage to more average conditions.	Protect within basin and downstream habitat and wildlife from flooding stress.
WCA-3A NW	Stage decreased by 0.20'	Maintain the recession rate to return marsh stage to more average conditions.	
Central WCA-3A S	Stage decreased by 0.05'	Maintain the recession rate to return marsh stage to more average conditions.	Protect within basin, upstream/downstream habitat and wildlife. Tree island ecology is diminished by flooding
Southern WCA-3A S	Stage increased by 0.10'		
WCA-3B	Stage decreased by 0.03'	Maintain the recession rate to lower marsh stage.	Protect within basin and downstream habitat and wildlife from flooding stress.
ENP-SRS	Stage decreased by 0.06'	Make discharges to the Park according to the current deviation with a return to COP protocol as soon as high water conditions are alleviated in the upstream WCAs	Protect within basin and upstream habitat and wildlife from flooding stress.
Taylor Slough	Stage changes ranged from -0.16' to -0.28'	Move water southward as possible	When available, provide freshwater buffer for downstream conditions.
FB- Salinity	Salinity changes ranged -4.5 to +7.1 psu	Move water southward as possible	When available, provide freshwater to maintain low salinity buffer and promote water movement.